PETROLEUM WEEK

DECEMBER 14, 1956

■ A McGRAW-HILL PUBLICATION

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Price 35 Cents

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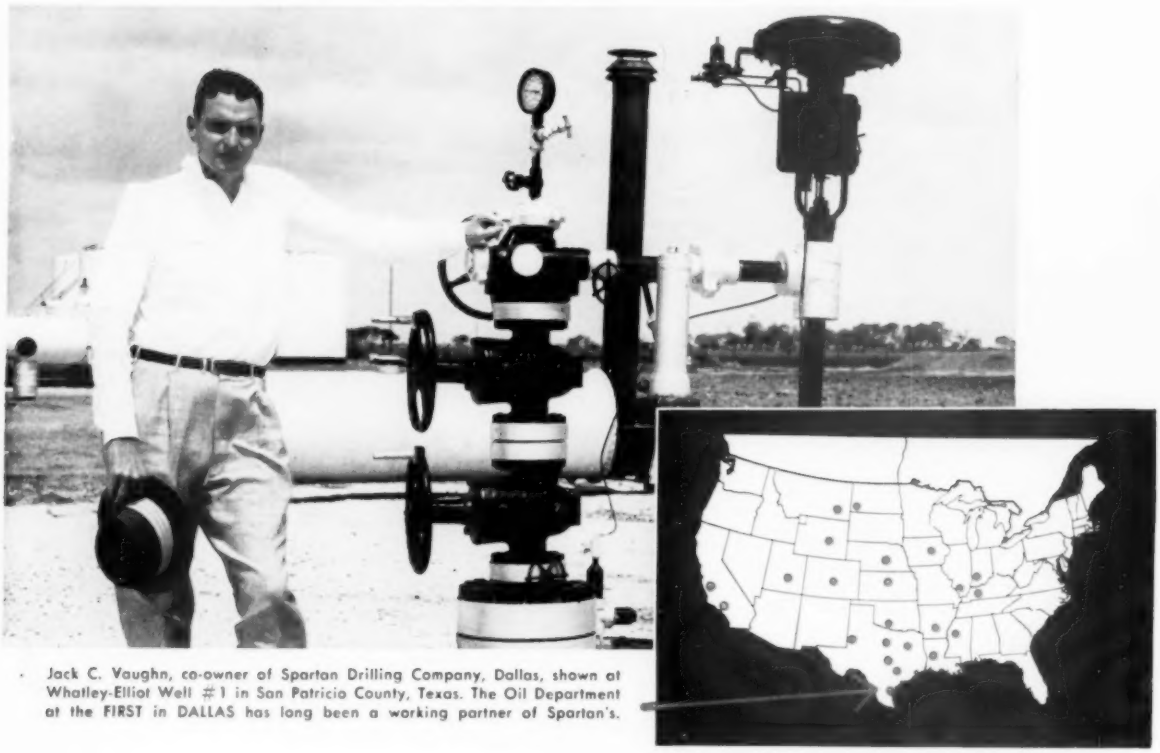

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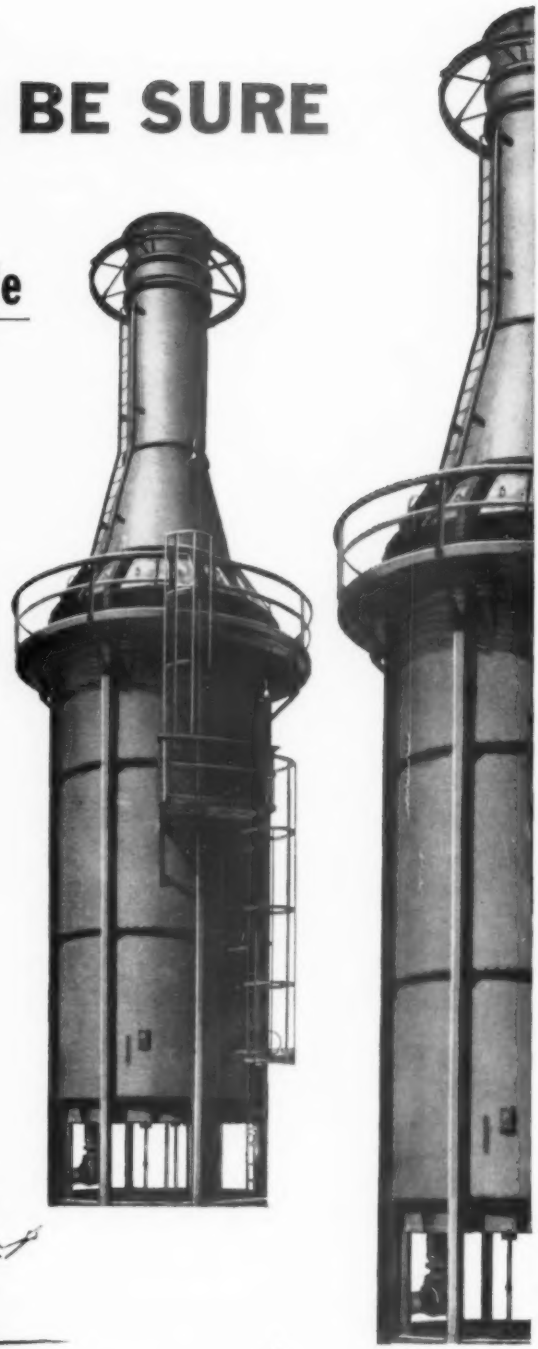

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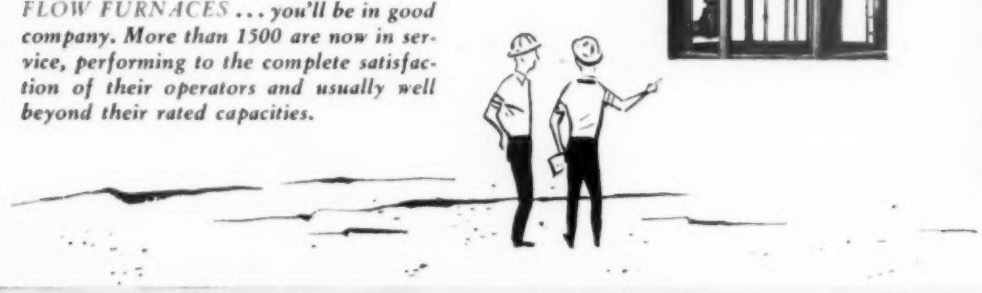

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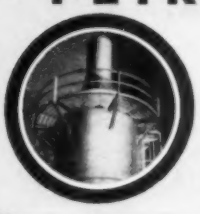

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NATIONAL PETROLEUM NEWS
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PLATT'S OILGRAM NEWS SERVICE
PLATT'S OILGRAM PRICE SERVICE

Vol. 3, No. 24—PETROLEUM WEEK—December 14, 1956
Number of copies of this issue printed: **33,433**

Published weekly by McGraw-Hill Publishing Co., Inc., James H. McGraw, (1860-1948), Founder.

Executive Editorial, and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office, 871 N. Franklin St., Chicago 10, Ill. Donald C. McGraw President; Paul Montgomery, Executive Vice President; Joseph A. Gerardi, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; J. E. Blackburn, Jr., Vice President and Circulation Director.

Subscriptions: Address correspondence to Petroleum Week, Subscription Service, 330 W. 42nd St., New York 36, N. Y. Current single copies, 35¢. Subscription rates, all countries: $3 for one year, $4 for two years, $5 for three years. Orders must indicate company, industry division, and position.

Second class mail privileges authorized at Chicago, Ill. Printed in U. S. A.

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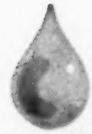

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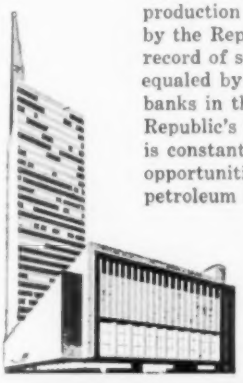
The nation's oil reserves are millions of barrels richer because of production loans made by the Republic. With a record of service to oil men equaled by few other banks in the nation, Republic's Oil Department is constantly seeking opportunities to serve the petroleum industry.



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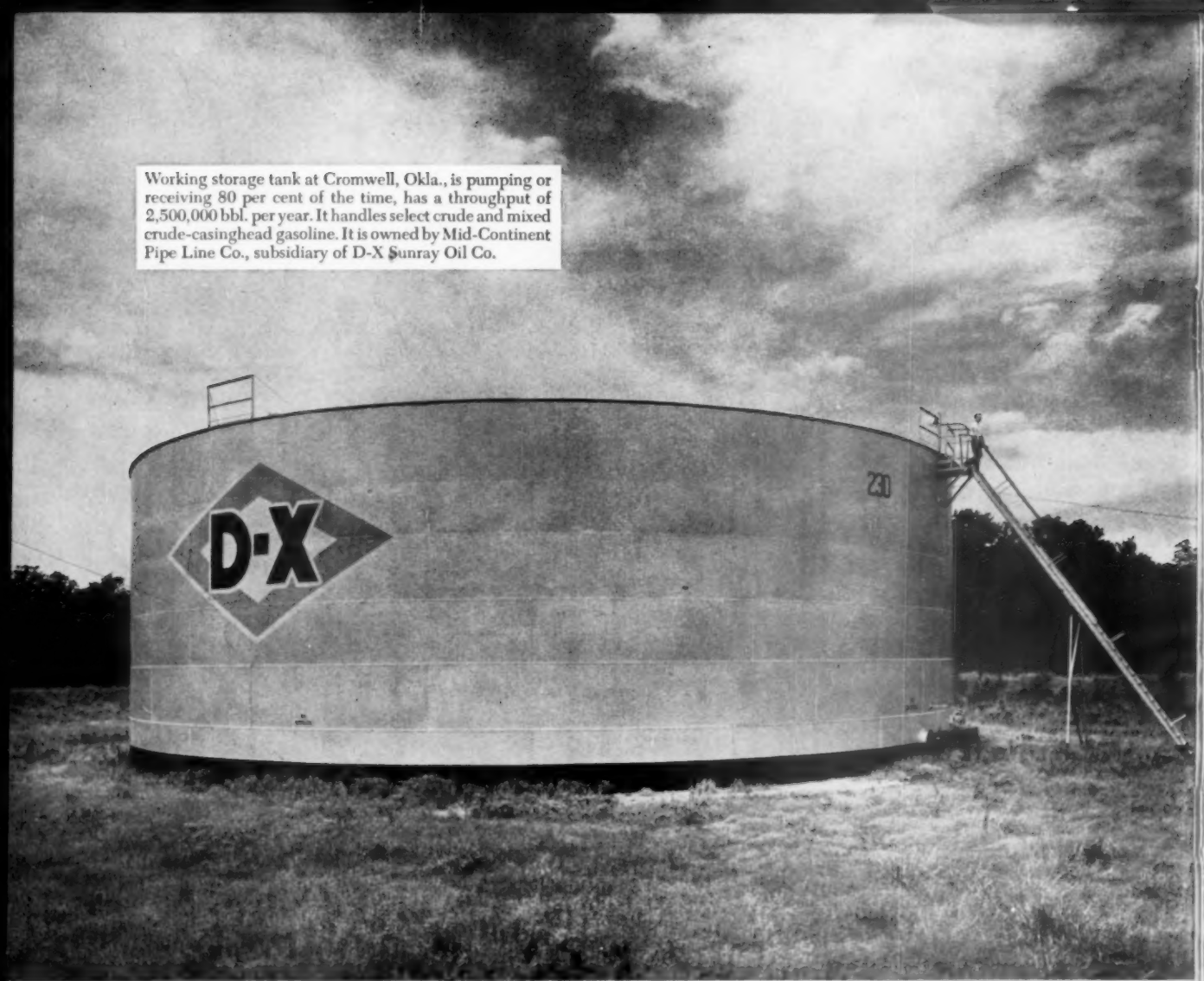

Working storage tank at Cromwell, Okla., is pumping or receiving 80 per cent of the time, has a throughput of 2,500,000 bbl. per year. It handles select crude and mixed crude-casinghead gasoline. It is owned by Mid-Continent Pipe Line Co., subsidiary of D-X Sunray Oil Co.

Still cutting evaporation loss after two years

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Two years ago, D-X Sunray Oil Co. equipped this 35,000-bbl. cone-roofed tank with "Microballoon" spheres made from BAKELITE Brand Phenolic Resins. Since that time, this vapor-stopping blanket has reduced evaporation loss an estimated 70 to 80 per cent according to D-X Sunray.

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60-Second Summary / WHAT'S HAPPENING IN OIL

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December 14, 1956

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Oil is beginning to move to Europe under a specific plan of action now. The government has approved two shipping schedules which reshape shipping patterns to make maximum use of available facilities. And the Middle East Emergency Committee has been authorized to work with Europe's OEEC and with the domestic industry to get the big supply job done quickly. . . . p. 10

•

Louisiana isn't going to hike its allowables again, at least not right away. State conservation officials, feeling the state is doing its share to supply Europe with crude, is continuing the December allowable into January. Even that will mean production of almost 1-million b/d.

•

A Federal Power Commission dilemma is costing the gas industry time and money. The agency, swamped with work created by the Phillips case decision, is falling farther and farther behind because it can't decide how to set field prices. . . . p. 12

•

The outlines of an industry gas bill is taking shape. This week, a tentative draft of proposals was being circulated through the industry. It was the result of conferences between leaders in production, transportation, and distribution. The aim: a unified approach this time. . . . p. 11

•

Oil company capital expenditures next year may top $6-billion for the first time, rising 8% over 1956. Any lengthening of the Middle East crisis, though, may bring some changes in the now-planned spending program. . . . p. 9

•

There'll be a big demand for intermediate-depth rigs in the Four Corners next spring. New pool discoveries and extensions—especially in the Aneth trend of the Paradox Basin—have touched off a rash of projects in the area. But all-out efforts must wait until the weather eases. . . . p. 21

•

A new fractionating tray—called a Ripple Tray—has been developed. Present data indicate that the tray can increase distillation capacity without the loss of fractionation efficiency. . . . p. 51

•

Five members of Phillips Petroleum Co.'s Natural Gas Dept. and a Phillips attorney were among eight killed in the crash of a company plane this week. Those aboard the plane included A. M. Rippel, manager of the Natural Gas Dept.; C. W. Binckley, D. F. Mayfield, W. C. Reed, and T. D. Young, members of the Natural Gas Dept.; George Sneed, an attorney for the company; and Joe Bower and R. E. Ulrich, pilots. All were residents of Bartlesville, Okla.

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau

December 14, 1956

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The coming change of faces in Washington will have an impact on government oil policies. Under Secretary of State Herbert Hoover, Jr., is out Feb. 1. There are solid indications that Defense Mobilizer Arthur Flemming also is stepping down soon—but he flatly refuses to confirm or deny the reports. Both men have played key roles in developing and implementing the voluntary effort to hold imported oil to its 1954 share of the U.S. market. And Hoover, especially, has played a key role in U.S. policy-making toward the oil-rich Arab world.

The attitude of the new policymakers will be important. Massachusetts Gov. Christian Herter is replacing Hoover, and may ultimately move up to Secretary of State. He is an internationalist and is expected to push liberal trade policies. Flemming has limited his function to coordinating and carrying out policies made in the White House. If he is replaced by a strong-willed individualist, there could be a major impact on tax amortization policies and—later—the oil import controversy.

•

Oil has a stake in the fight for power among Senate antitrusters. Sen. Joseph O'Mahoney (D., Wyo.) took over as chairman of the antimonopoly subcommittee in the last Congress because Sen. Estes Kefauver (D., Tenn.) —who holds seniority over him—was busy running for president. The Tennessee senator wants to be chairman now. O'Mahoney appears to have the job nailed down, but the final answer won't be known until Congress meets in January.

An anti-price-discrimination bill is high on Kefauver's list. He would push a new Kefauver-Patman measure as part of an ambitious investigation aimed at showing that "monopolists" are squeezing out small business. The bill—opposed by jobbers and major oil companies—would require a supplier to lower his price to all customers in a competitive area if he lowered it to one. The National Petroleum Assn. is advising its members to start writing their congressmen now to head off the measure.

O'Mahoney is more interested in international oil activities. A long-time advocate of more government control over U.S. oil companies operating abroad, he is watching the Middle East Emergency Committee closely. He may step in if handling of the oil-for-Europe operation leaves him an opening.

•

The regulatory outlook for gas producers is more bleak than ever. The Federal Power Commission now says flatly that independent producer rates cannot be set merely on evidence of arms-length bargaining and weighted average field prices. This ruling, based on the court decision in the Panhandle Eastern case (page 12) indicates that cost of production must be a factor in setting producer rates.

•

The State-Federal Offshore Committee is awaiting survey results. The group is charged with pinning down location of the Louisiana coastline, from which the state's offshore boundary is to be measured. The committee has agreed on the western third of the coastline. But the remainder can't be settled until the U.S. Coast & Geodetic Survey completes a detailed study. Once the shoreline is settled, the Supreme Court still must decide whether Louisiana is entitled to a strip 3 mi. or 10 mi. wide from there out.

GASOLINE KEEPS ITS POWER IN STORAGE WHEN IT CONTAINS

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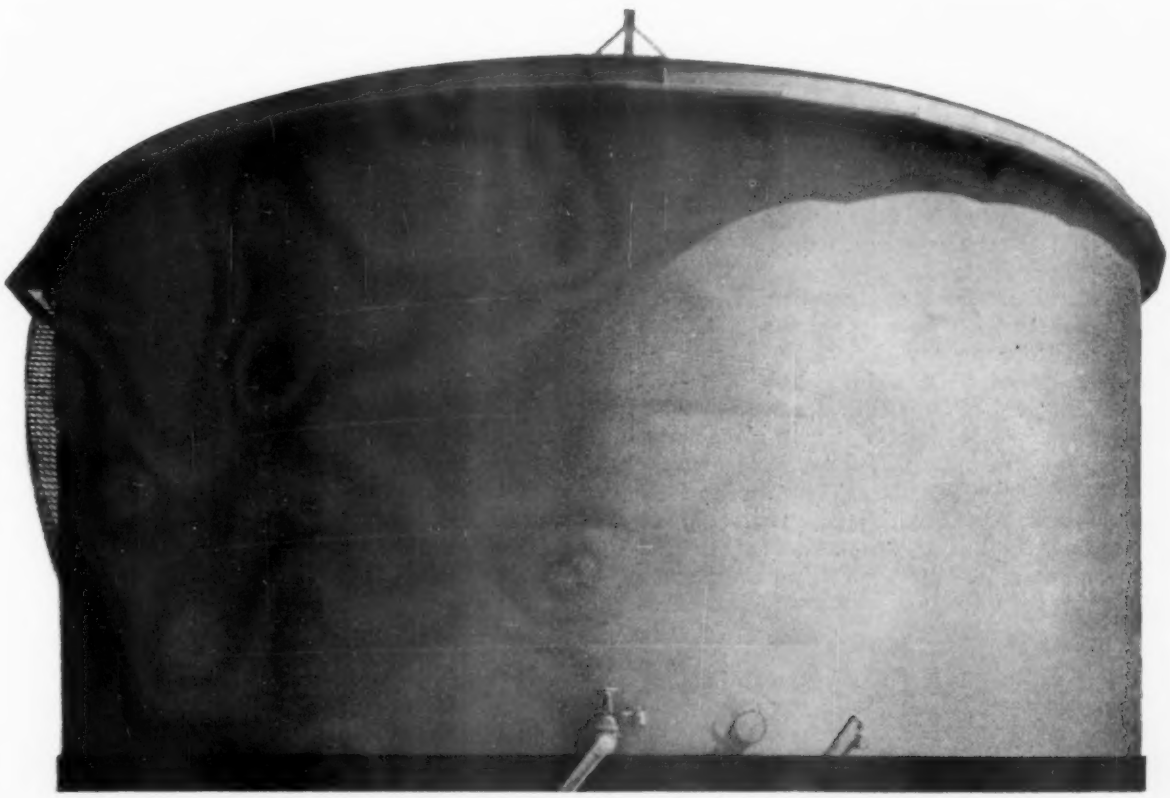

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FLUOR BUILDS PLANS INTO PROFITS

In 1956 the Mexican Petroleum Industry (Petroleos Mexicanos) dedicated its newest unit, the expanded and modernized refinery at Minatitlan, on Mexico's East Coast. Included in the project are a TCC unit with fresh-feed capacity of 10-12,000 bbl daily and total capacity of 15,000 bbl daily, two 25,000 bbl crude distillation units, a catalytic polymerization unit, and complete supporting and offsite facilities.

Petroleos Mexicanos placed complete responsibility for design of all units in the hands of The Fluor Corporation, Ltd. As an example, steam-generating facilities, an integral part of the refinery, were designed by Fluor's Power Engineering Department. In addition, all construction – from site preparation to plant completion – was supervised by Fluor representatives at the site. As a result the plant has met all expectations.

When your plans for expansion call for single units or complete refineries in any part of the world, *be sure to include Fluor.*

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Unless capital spending plans are changed by the Middle East crisis . . .

Drilling and production outlays will go up only 1% next year, to $4.2-billion;

Refiners will boost spending by 50%, primarily for process units to make higher-octane gasoline;

Marketers plan to increase spending by 9%, to allow for larger volume, more gasoline grades; and

Transportation spending, excluding gas lines, may be held to $350-million, up 9%. On present plans . . .

Oil's Spending Will Top $6-Billion

The petroleum industry's capital spending next year will top $6-billion for the first time, an increase of 8% over the outlays made this year.

The total industry outlays for new plants and equipment are estimated at $6,059,000,000. And current estimates are that capital expenditures in 1958 will be at least as high as those expected in 1957.

Higher capital spending in 1957 will be noticed in all major branches of the industry.

This level of spending is shown in the Preliminary Survey of Business Plans for New Plants and Equipment, conducted by the McGraw-Hill Dept. of Economics. The survey found that business capital expenditures are "heading for stability at a high level." Total capital spending by all business in 1957 is placed at $40.2-billion, a gain of 11% over 1956.

The planned capital expenditures by the oil industry next year will represent an indicated gain of only 2% in the physical volume of expansion, because of expected price increases.

Oil industry representatives expect that prices the industry will pay for steel and other materials in 1957 will be up 6% over 1956 prices.

Also, the 8% gain now planned for 1957 includes some deferred 1956 spending—spending that was held up by tight steel and tight money. And it is quite likely that some of the 1957 planned expenditures may carry over into 1958 for the same reasons.

But regardless of tight steel and hard-to-get money, very few cancellations of previously planned expenditures are reported. The net effect, at least so far, is to stretch out spending plans.

So far the Middle East crisis hasn't had any big effect on oil industry spending plans for 1957.

The McGraw-Hill survey was conducted during November and December—after the Presidential election—and the information reported reflects preliminary plans. And, while in the past the preliminary surveys have accurately shown the trend of capital spending, there could be some shifts in spending plans within the oil industry because of the Middle East situation.

No one can predict just how long a large volume of U.S. crude will be needed by European countries to offset the lost Middle East supplies.

This shows up first of all in the increase of only 1% now planned for drilling and production capital spending for 1957.

After several years of large increases in new well completions, and a growing volume of excess producing capacity, it would be reasonable to expect only a modest rise in the capital outlay for drilling and production for next year.

But now an abnormal situation exists. There will be little surplus producing capacity—at the start of 1957, at least.

And if the present curtailment of the Middle East flow of oil lasts long enough, domestic producers may have to step up their drilling programs substantially over 1956, spending more than the $4,179,000,000 that is now planned.

The whopping 50% increase projected for refinery spending for next year is another indication that the European crisis is not yet reflected in expansion plans.

The biggest share of the planned refinery expenditures of more than $1-billion is for process units designed to upgrade gasoline octanes and to make higher quality fuel oils and lubricants.

But at the time these plans were made, the expectation was for a "normal" situation in 1957, with gasoline octanes continuing higher into the 100-plus range.

A tight crude oil supply next year, however, combined with the need to

spend money for new production, could change the plans for "higher-octane" spending.

The marketing branch of the industry is planning a 9% hike in spending, based on growing demand plus the growing expansion of multigrade gasolines.

Spending in this branch of the industry may have to be curtailed if the Middle East situation should remain unchanged for a long period.

And, in view of the Middle East crisis, the $350-million now planned for liquid pipelines and other forms of transportation may prove to be quite low.

As of now, oil companies plan to spend $350-million on transportation facilities next year, a gain of 9% over last year.

But, based on the present volume of demand because of the Middle East situation, considerably more pipeline capacity may be needed in the U.S., and more tankers could be used in both coastwise and foreign service.

(The $350-million planned for transportation expenditures does not include natural gas transmission lines, for which the planned expenditures next year are $950-million, up 52% over 1957.)

The way plans are shaping up in the Southwest now would indicate that spending for new crude oil lines from inland areas to the Gulf Coast will run well above what was planned last week, or even yesterday.

Oil Unions Ready '57 Wage Drive

The oil unions may be tougher to bargain with in the months ahead than they've been in the past few years.

The 1956 wage drive was settled in February, with a minimum of friction. The unions accepted a general wage hike of 6%, plus some shift differentials and other fringe benefits.

There were a few isolated strikes. But for the most part, it was a quiet year on the labor front. And the indications were that it would be much the same during 1957—until the Middle East crisis erupted.

The stepped-up industry activity to supply Europe with oil gives the unions a stronger bargaining position.

Until the demand for Western Hemisphere crude oil soared, the domestic industry was struggling to keep its head above rising crude and product stock levels. Some price cuts were in the wind.

That situation hardly provided the proper setting for a strong union push for higher wages. Now the situation is changing, at least to some extent.

The unions will have an even stronger talking point if oil prices rise.

Union leaders will be quick to point to increased sales and to increased prices as justifications for higher wages.

They may have trouble in selling this approach in refinery circles—and that's where the unions have the most membership—if gasoline stocks continue to run high. Domestic refiners point out that the new demand is for crude, not for products.

The Oil, Chemical & Atomic Workers Union, in opening its 1957 campaign this week, says that there are "many" factors justifying the 27¢-an-hour increase—plus wage benefits—that it seeks.

OCAW lists cost of living increases, the improved national economy, and increased productivity in the oil industry. It also points to wage and fringe benefits being won by unions in other industries.

OCAW had set its sights slightly higher than the goals set recently by several independent oil union groups. These, for the most part, are asking for wage hikes of 9% to 10%, with a minimum of 25¢ an hour.

OCAW's 27¢ target runs a little over 10%, since average hourly earnings under union contract start at about $2.56 an hour on straight time, or $2.67 an hour on an average-gross-earnings basis.

About 105,000 OCAW members will be directly affected by the bargaining. The union has more than 600 contracts in the oil industry. Some of these are open for bargaining now, and the majority will be open by early spring.

Bargaining is done on a plant-by-plant basis, but each local is instructed not to accept contract terms below the target figure without clearance by the national bargaining policy committee.

The upcoming bargaining by OCAW and the independent unions may determine which will be the pacesetter.

If a substantial number of independent unions agree to terms first, OCAW may find it difficult to hold out for better settlements.

OCAW traditionally has set the pattern for the smaller unions. But there has been a growing effort by some independents to take over the reins.

U.S. Approves MEEC Aid Plan

Members of the Middle East Emergency Committee began pooling their efforts this week—under schedules approved by the government—to help meet Europe's fuel shortage.

Felix Wormser, Assistant Interior Secretary, announced approval of the first two schedules recommended by MEEC.

He praised the committee, composed of 15 U.S. oil companies with overseas operations, for coming up with initial schedules within a week after President Eisenhower's order set the government-industry machinery in motion.

The approved schedules involve an extensive reshuffling of oil movements in the Free World—including a cutback in U.S. imports from Venezuela.

The new pattern looks like this:

- Oil that has been moving from the Persian Gulf or Eastern Mediterranean to the U.S. and Canadian East Coasts will be diverted to Western Europe. It will be replaced by oil from the U.S. Gulf Coast.
- Oil that normally moves from the Caribbean area to the U.S. and Canadian East Coasts will be diverted to Europe, to the extent that substitute supplies are available from the U.S. Gulf Coast.
- Tankers carrying oil around the Cape of Good Hope to Western Europe will move from there to the Caribbean. They will carry petroleum supplies from there to the South American East Coast, and then move empty back to the Persian Gulf.
- U.S. crude and products will be shipped to Europe to the maximum extent possible, making up much of the European fuel deficit. But this deficit will amount to some 20% of normal supplies.
- No action in regard to oil shipments bound for points East of Suez, or the U.S. West Coast, will be taken until the situation clarifies.

The object of all this, of course, is to make the best use of available petroleum resources and transportation facilities.

Government officials indicate that shipments to Europe from the U.S. may not average much over 500,000 b/d, because of bottlenecks in internal U.S. transportation.

Hugh Stewart, director of the Interior Dept.'s Office of Oil & Gas, says tanker availability at the Gulf Coast in the last half of December will be some 1.2-million b/d. Then, as the

tankers make their turnarounds at their destinations, the average will fall to 778,000 b/d during January. It will move up again in February.

However, U.S. officials believe shipments to Europe won't top 500,000 b/d—unless new steps are taken to make more U.S. crude available at Gulf ports.

The capacity for moving additional crude to Gulf ports is estimated at 850,000 b/d—including some use of railroad tank cars. And 300,000 b/d or more of this must go to U.S. refineries on the east coast.

However, the industry is still working to increase these shipments to tidewater. And much will depend on whether the Texas Railroad Commission will temporarily abandon its statewide ratable-take provisions in order to step up production where it can be most easily moved to Gulf loading points.

Federal spokesmen say available tankers must be redeployed around Africa unless other states follow Louisiana's lead, and sharply increase the production allowable "very soon."

They point out that the Texas Railroad Commission allowed only a 75,000 b/d step-up for December. Although vowing they won't try to tell the states what to do, these officials say they would be "very happy" to see Texas boost its allowable another 300,000 b/d "for a starter."

The commission meets Dec. 19.

If it appears that sufficient crude won't be available at Gulf points soon, tankers must be redeployed, it is asserted.

The original plan of action has been amended to allow MEEC cooperation with European oil planners—and to permit cooperative action within the U.S. as well as abroad.

MEEC now is authorized to cooperate with the Organization for European Economic Cooperaion.

"A tanker may be bound for a country A when OEEC finds the oil is needed more in country B," explains a top official. "This means that OEEC can divert the tanker at mid-ocean to where it's needed most."

Also, MEEC members are now authorized to cooperate on coastwise tanker movements, and to make loans, exchanges, and other transactions with domestic operators. Specific approval for the latter type of transactions apparently must be obtained, however.

Details of the transactions under the approved schedules need not be cleared by the government in advance—but the Justice Dept. will do a close "post-audit" to catch any unwise actions quickly.

Gas Bill Proposals Aired

A tentative draft of a new gas bill is being circulated within the industry for study and comment.

The purpose is to provide a possible compromise acceptable alike to producers, pipeliners, and distributors.

The proposed measure would establish standards for a "reasonable market price" determination by the Federal Power Commission. It would ban a cost of public utility rate base concept for field pricing.

In determining whether a new contract meets a "reasonable market price" test, FPC would be required to consider such factors as these:

- Whether there was competitive, arms-length bargaining;
- The reasonableness of contract provisions in view of existing and future prices;
- Assurance of an adequate supply of gas to the consumer.

FPC would also consider the current level of prices in the same field, although it would not be bound by them.

The term "escalation clause" would be defined, and the types described would be outlawed. These include:

- Automatic increases in a contract price to meet higher prices being paid in the same field or area; and
- "Spiral" clauses, which permit an increase if the resale rates of the purchaser are increased.

The mechanics for FPC review of contracts would also be spelled out.

A purchaser would be required to file purchase contracts, with FPC, and copies would go to each person or municipality buying gas from the purchaser for resale.

Any objection would have to be based on one of three contentions. (1) that the price exceeds the "reasonable" market price standard; (2) that the contract contains a banned escalation clause; or (3) that the contract shortens the duration of an existing contract.

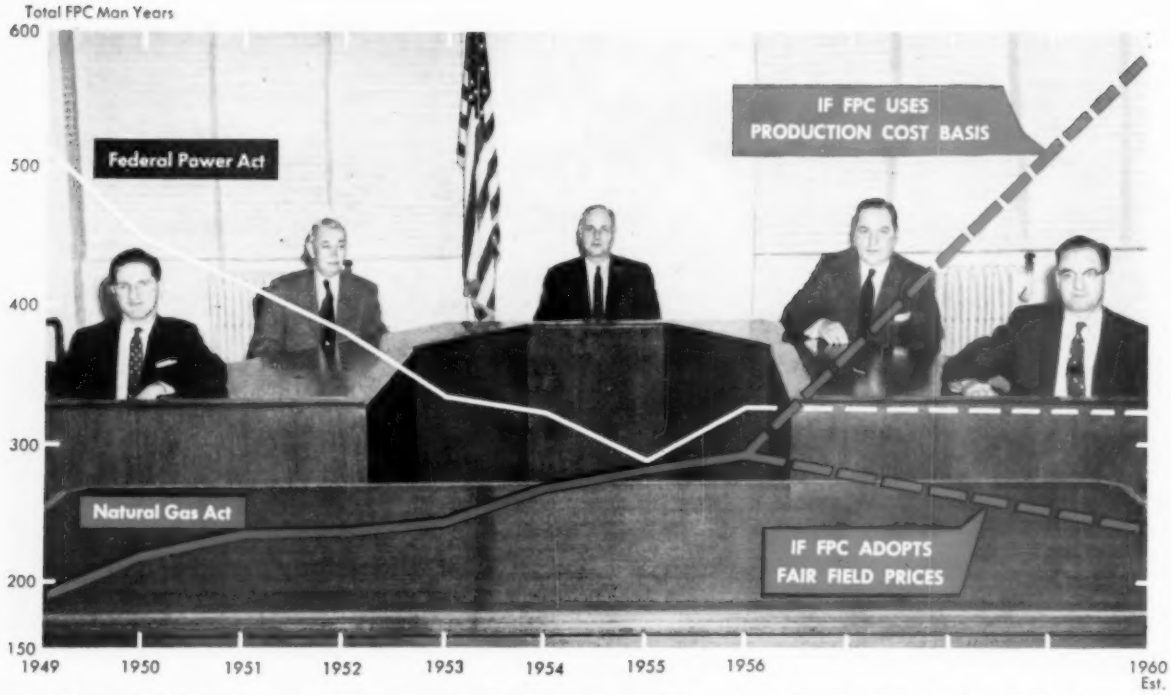
FPC also could initiate its own hearing within a specified time.

Fixed, periodic price increases apparently would be considered as a part of the over-all price in a new contract, and would be subject to the "reasonable market price" rule.

In old contracts, a producer could waive benefits from banned escalation clauses, or ask for FPC approval as such increases occur.

J&L Supply Headquarters Dedicated

Top officials of Jones & Laughlin Steel Corp. participated in ceremonies at Tulsa last week dedicating the $1.7-million J&L Supply Division headquarters building and supply store. Adm. Ben Moreell, J&L chairman, cut a wire robe "ribbon" with a blow torch (above), watched by (l. to r.) Rainey Elliott, Supply Division president; John E. Timberlake, J&L vice-president-sales; and C. L. Austin, J&L vice-chairman. Elliott announced that J&L has budgeted some $250-million over an 18-month period to increase the supply of tubular goods to the oil and gas industry.



FPC COMMISSIONERS W. R. Connole, Seaborn Digby, Jerome Kuykendall, Frederick Stueck, and Arthur Kline face big problems.

As FPC workload keeps climbing . . .

Gas Producers Face Costly Delays

The mountainous backlog of work facing the Federal Power Commission is slowly being whittled down. But the backlog—and the costly delays to the companies involved—will remain until an answer is found to the problem of regulating independent gas producers.

The commission already had its hands full regulating interstate gas pipeline companies and electric power companies when the U. S. Supreme Court handed down its decision in the Phillips case in June, 1954.

Instead of exercising jurisdiction only over some 130 pipeline companies, FPC found itself saddled with the responsibility of regulating thousands of producers whose operations bear little or no resemblance to traditional public utilities.

The commission doesn't even hope to catch up before 1960 even though it is beginning to show some signs of progress.

Producers have filed applications for almost 8,000 certificates of convenience and necessity—required of any company selling gas destined for interstate commerce.

A year after the Phillips decision, FPC faced a backlog of 4,954 certificate applications. This has now been reduced to 1,900—including 800 applications which have been pending since 1954.

Much less progress has been made in handling rate cases, however.

Last June the number of proposed rate increases that were being contested stood at 178. Now the total has climbed to 348.

In the entire period since the Phillips decision, only three rate cases have found their way through the ponderous commission machinery to a final decision.

This points up the observation by FPC Chairman Jerome Kuykendall that the traffic jam facing the commission is not the result merely of stepped-up volume, but reflects the fact that FPC is groping to find its way through an uncharted area of regulation.

Applications by pipeline companies are getting bogged down, too. More than 400 cases are pending, a 30% increase over a year ago.

The delays caused by the commission logjam are costly both to producers and to pipeline companies—and ultimately, in some cases, to the consumer.

A natural gas company that submits an application to FPC may get results in a few weeks—if it is lucky and there is no opposition. But if it's a controversial case, it may drag on for many months—even years.

One veteran pipeliner says his company figures a long, drawn-out case costs up to $500,000 to fight.

The uncertainty of commission action also plays hob with business decisions. As one industry source explains:

"We're forced to make decisions on the basis of proposed rates which we expect to be approved. When a decision is delayed, and then turns out to be adverse, there's such a cumulative error that our whole planning is thrown out of focus."

All signs indicate that producers are going to have to continue dealing with FPC even if new legislation easing the burden of federal regulation is enacted by Congress.

Most talk of compromise legislation acceptable to producers, distributors, and the White House assumes that the chances of flat exemption for producers are slim.

Thus, it is important for producers to understand the functioning of the

commission—and some of the problems concerning producer regulation.

I. Who Runs FPC?

A key to many of the difficulties experienced by producers at FPC can be found in the development and organization of the commission.

FPC was created by the Federal Water Power Act, in 1920, to handle licensing of hydroelectric projects. It was organized as an independent commission in its present form in 1930.

It was during the Roosevelt Administration, however, that FPC came of age as a body with vast regulatory powers over hundreds of electric power and gas companies.

In 1935, Congress passed the Federal Power Act, which gave FPC jurisdiction over the transmission and sale of electricity in interstate commerce.

The Natural Gas Act of 1938 extended the commission's control to the interstate transmission and sale of natural gas.

In theory, FPC is a creature of Congress, not responsible to the executive branch. But in practice, the administration in power exercises more influence than Congress on the regulatory philosophy of the commission.

Decisions are made by the five FPC members, each appointed by the President for a term of five years.

No more than three may come from the same political party.

Members of the commission are Chairman Jerome K. Kuykendall, Republican; Seaborn Digby, Democrat; Arthur Kline, Republican; Frederick Stueck, Republican, and William R. Connole, Independent.

These men determine FPC policy, make decisions, and review contested rulings by hearing examiners.

However, the commission's staff experts exercise tremendous influence on the final decisions of the five commissioners.

This is just as true at FPC as it is in a corporation or a city government, where the policy-makers must depend on specialists to do the spadework on which decisions are based.

The fixing of "just and reasonable" rates for gas and electric companies is a complex business. The FPC staff includes engineers, accountants, and lawyers, whose job it is to go over these applications closely and then to make recommendations to the commission.

In rate cases, the commission decision on whether a proposed rate should be suspended pending investigation is largely a staff decision.

It's the staff that makes field investigations to determine whether proposed rates are just and reasonable.

Hearing examiners give considerable weight to these staff studies in making their intermediate decisions—which become final in 30 days unless protests are lodged.

And the general counsel advises the commission on its final decision in cases where the examiner's decision is reviewed. (It usually is.)

II. 'Holdover' Influence

Industry critics of FPC charge that "holdover" staff members from the old New Deal days are using their power in effort to dictate policy to the commission.

These critics—and there are many among gas lawyers who practice at FPC—say this "bias" is most apparent now in the controversy over the regulation of independent gas producers.

The commission majority went on record in the last Congress for legislation to ease federal regulation of producers. This measure, which was vetoed by President Eisenhower last February, provided for pricing gas in the field on a commodity-value basis, as determined by other prices in the same field or nearby fields.

Chairman Kuykendall has repeatedly said in speeches that producers cannot be regulated properly on a cost-of-production basis.

Still, the staff has consistently pushed the "cost" approach. And there are industry fears that the staff view will ultimately prevail.

There is a widespread belief—justified or not—that the FPC staff actually promoted the Phillips case, despite the commission majority's conviction that independent producers were not covered by the Natural Gas Act.

According to this story, staff members collaborated behind the scenes with James H. Lee, assistant corporation counsel for the City of Detroit, who ultimately argued the case before the Supreme Court.

More recently, the staff's opposition to the Harris-Fulbright bill found its way to Capitol Hill, and played a part in Congressional consideration of the measure.

Critics credit the staff with clever strategy in not trying to push a straight cost formula for producers through the commission—a move that would almost surely have failed.

Instead, they say, the staff has urged that the commission go easy on specifying what type of evidence producers must submit in order to justify a proposed rate increase—as long as cost figures are submitted. Thus, it is alleged, the staff is making sure cost will be a key factor in the eventual formula.

Defenders of the staff say the complaints simply show that producers are still feeling saddle sores as a result of the Phillips decision.

Referring to the charges of staff dominance, Chairman Kuykendall says: "That problem may have existed when I came into office in 1953. But I don't believe it does now."

Carl Kallina, chief of the Bureau of Rates & Gas Certificates, denies that the staff tried to dominate. He says the staff never takes a stand in contradiction to an expressed commission policy.

At present, he points out, the commission has not arrived at a rate-setting formula for producers. So the staff is free to make suggestions.

III. Manpower Problems

The commission admittedly faces a serious manpower problem in terms of qualified personnel. This contributes to the delay in handling cases.

When the Phillips decision was handed down, the commission had 631 employees. Despite the tremendous increase in workload, manpower now stands at 720.

The failure of manpower to keep pace with the workload is not due to any lack of appropriations. It stems from the fact that FPC work is highly technical, and there is no really adequate preparation except actual experience at the commission. This rules out any wholesale hirings.

FPC is trying to build up its staff, but the program is falling behind.

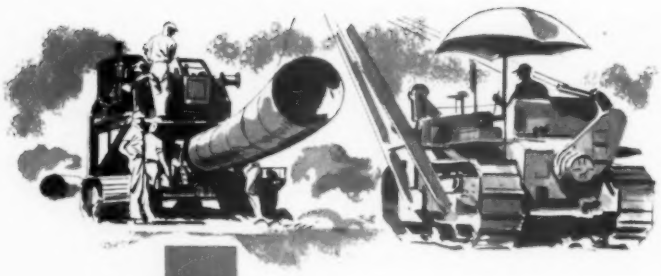
One handicap FPC is finding is that most college graduates seem to prefer a job with a corporation to the role of "crusader" with a government agency. Also, FPC's salary range is relatively low.

IV. Solutions

FPC has already speeded up handling of routine independent-producer cases.

An abbreviated procedure is used whenever there is no opposition to an application. This allows a case to go directly to the full commission without a hearing, thereby saving many months of consideration.

Last year, 98% of independent-producer certificate applications were



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handled in this manner, which does not even require the applicant's presence. The abbreviated procedure was used in 70% of the pipeline cases.

Also, temporary certificates are issued promptly—without notice or hearing—in case of emergency.

And, recognizing the lack of adequate accounting records in many independent-producer operations, FPC has waived its uniform system of accounts, and has required producers to file only annual reports giving essential data.

Kuykendall says producers themselves can speed up commission action by cooperating with FPC investigators in opening up company records.

V. Uncertain Future

The type of regulation ultimately adopted for producers will have a major influence on the commission's ability to catch up with its responsibilities.

Kuykendall endorses estimates that the staff will have to be doubled if a thorough investigation of costs is to be made on producer rate applications.

On the other hand, adoption of a pure fair-field-price method would leave mostly a statistical task, and enable FPC to reduce the number of employes used on gas regulation by 150.

There are signs that the staff is now angling for a formula that will take both costs and field prices into consideration.

Even those commissioners who sympathize with the producer viewpoint are inclined to believe that the Panhandle Eastern court ruling virtually forces the commission to consider cost in fixing producer rates.

Any new legislation that does not specifically eliminate cost as a factor is unlikely to keep cost out of the picture for long, in the view of many gas lawyers.

Still, such cost-formula advocates as General Counsel Willard Gatchell have conceded publicly that cost may not be the whole answer, after all.

The staff's next move may be to recognize the validity of fair field prices—but to interpret this on a geological, rather than a geographical, plane.

In other words, instead of taking the weighted average of all the prices in a given area, only those wells drawing from the same strata or depth would be averaged together.

"This looks like a back-door approach to cost," comments one industry man.

What's New / IN THE INDUSTRY

Streamlining Step

Standard Oil Co. of California, in a decentralization move, has formed a new subsidiary to manage its operations in the West.

The wholly-integrated subsidiary is Standard Oil Co. of California, Western Operations, Inc.

Two years ago, the parent company consolidated its western activities under separate division management. Establishment of Standard-Western now completes this transition, giving the western division the same status as the company's other domestic and foreign subsidiaries.

One purpose of the streamlining is to free California Standard's executives from day-to-day operating responsibilities, so they can concentrate on long-range planning and top policy determination.

•

Gas Deal Approved

New drilling activity in North Texas is expected to follow last week's decision by the Federal Power Commission authorizing Natural Gas Pipeline Co. of America to tap the area with a big-inch line.

The pipeline company will build a 350-mi., 20-in. to 26-in. line from its present system in the Texas Panhandle through southern Oklahoma to Jack and Wise Counties, Texas. Estimated cost is more than $32-million.

The line will provide an outlet for 110 idle gas wells, many of them on land under lease to Christie, Mitchell & Mitchell, Houston independent oil firm (PW—Sep.28'56,p23). Gas reserves dedicated under the contracts—also approved by FPC—are estimated at more than 750-billion cu. ft. Producers will receive 13¢ per Mcf., but a Btu-content clause may raise that to 14¢.

FPC turned down a rival project proposed by Lone Star Gas Co., but authorized Lone Star to sell up to 100-million cu. ft. daily to Natural.

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The oil and gas industry is again seeking Congressional relief from a federal excise tax on the movement of men and materials in tideland operations.

Last week Humble attorney Lee Hill, of Houston, representing the Mid-Continent Oil & Gas Assn., took the industry's case to a House Ways & Means subcommittee.

What the industry wants is a Congressional amendment to the tax laws—one that would stop the Internal Revenue Service from slapping a 3¢ transit tax on crew boats, tugs, and helicopters hired for tidelands oil and gas activities.

•

California may use offshore oil royalties to build water and power projects.

Gov. Goodwin J. Knight, who favors it, says such a fund would probably amount to over $160-million through the fiscal year 1957-58.

•

The Baytown Employees Federation has accepted—after many months of negotiations—new contract at Humble Oil & Refining Co.'s Baytown (Tex.) refinery.

The contract controversy was over nonwage issues. R. R. Dawson, union president, says talks on wages are to start soon.

The union is seeking a 10% increase, with a 25¢-an-hour minimum hike.

•

The government hasn't decided yet whether to allocate steel plate for new tanker construction.

The Defense Mobilization Board discussed the problem last week, and will meet again on it soon.

Maritime Administrator Clarence Morse says allocations are needed to avoid serious delays in additional tanker construction.

However, others feel it would open the door to claims for allocations by other industries.

To qualify for allocations, tankers would have to be classified as a direct defense requirement.

•

Half a million dollars is burning a hole in the Bureau of Mines' pocket because it can't find the technical personnel it needs.

It got the funds from Congress to increase its staff, but it is still trying to fill 142 posts, including seven petroleum engineers, four physicists, and 28 chemists.

PETROLEUM COMMENTS / By Wanda M. Jablonski

Oil and Tempers Are Running Short in Europe

LONDON—Two things about the oil crisis stand out in bold relief on this side of the Atlantic, neither of them very pleasant:

• Even under the best of circumstances, the oil shortage will cause considerably more suffering in Europe this winter than is generally realized in the United States.

• Washington's much-publicized action withholding oil aid for almost a month—however justified it may have been for other considerations—has left a legacy of misunderstanding and bitterness with the man in the street here that may take a long time to overcome.

* * * *

To the average Englishman, Frenchman, Italian, or Swede, the present crisis is bringing home for the first time his rapidly growing dependence on oil, and on Middle East oil in particular.

The plain fact is that Europe never experienced oil rationing for industry before. During the last war, oil rationing meant little more than gasoline rationing. Since the war, however, Europe's basic coal shortage, and the rapid swing to oil for industrial expansion, have greatly changed the picture.

Now the oil shortage means a cut in industrial production in many cases—affecting men's jobs and livelihood, and the welfare of their families. And with the basic economy in England and many European countries so much more marginal than in America, there's little cushion of fat to absorb the cuts.

* * * *

Jobs are already beginning to be affected. Last week an estimated 95,000 British workers were already on short-time shifts. Of these, 40,000 were the direct result of fuel oil and gasoline rationing. The most direct effect so far has been in the automobile industry, where about 56,000 workers are on a short time.

The full impact hasn't been felt yet, however. In an effort to hold employment at the highest level possible, Britain has cut industrial fuel oil allocations by only 10% in December (though slashing industrial and commercial heating by 25%, home heating by 33%, and gasoline use by 25%).

But stocks are falling rapidly, both here and on the continent. By the beginning of January, fuel oil supplies are expected to be running 20% to 25% below needs. An authoritative source connected with the OEEC oil planning group, now meeting in Paris, paints the picture this way:

"Even on the best hypothesis, Europe will be experiencing a minimum 25% shortage in over-all oil supplies, and at least a 30% shortage in heavy fuel oil. And by the best hypothesis, I mean full coordination of supplies and tankers from the United States, speedy partial reopening of the IPC pipelines in Syria, and the Suez Canal.

"Some unemployment and economic distress, varying in degree in different countries and different industries, is unavoidable. A 10% cut in industrial fuel oil can be managed. Another 5% cut will bring some repercussions. But once the cut goes over 15%, repercussions will multiply.

"The curve goes up steeply. Loss in industrial output caused by the 5% increment from a 20% cut to a 25% cut is much greater than that caused by the 5% increment between a 10% and a 15% cut. Many industrial processes require continuous furnaces. Oil supplies for these can be trimmed only so far before a complete shutdown is brought about."

The impact will, of course, vary in different countries, depending on the extent to which their total industrial fuel supplies depend on oil. The range is considerable, all the way from Sweden, where 40% of all industrial energy is supplied by oil, through Italy with 27%, Netherlands with 26%, Belgium and France with 13% each, and the United Kingdom with 7%, down to West Germany with only 3%.

The effects in Germany are thus likely to be nominal, aside from halting the recent rapid industrial expansion. But Italy is likely to be hit especially hard, since no coal or other fuel sources exist, except for some gas in the North. In Britain, the chief concern is over the steel industry, where half of the open hearth furnaces depend on fuel oil.

* * * *

One of the most disturbing aspects of the whole problem is the false impression of the true oil situation in the public mind, both here and on the continent, as a result of the widespread publicity given to Washington's "withholding oil aid" for several weeks. The bitter attention focusing on Washington's ban has completely obscured the fact that considerable extra oil was in fact being shipped to Europe individually by American and British companies.

Also, exaggeratedly high estimates in the press of the size of United States surpluses—over 1.1-million b/d—left the impression that, once the ban was lifted, plenty of oil could be made available. The fact was largely obscured that the main shortage is of tankers, not of oil, and that the extra oil that could be delivered after the Washington ban was lifted would still leave a considerable European gap.

The bitter feeling is typified by the comment of one woman in a London bus queue:

"Those Americans have got all that oil but won't let us buy it. It's like withholding blood plasma from someone because he's been a bad boy. My husband may lose his job. But a lot those Americans care!"

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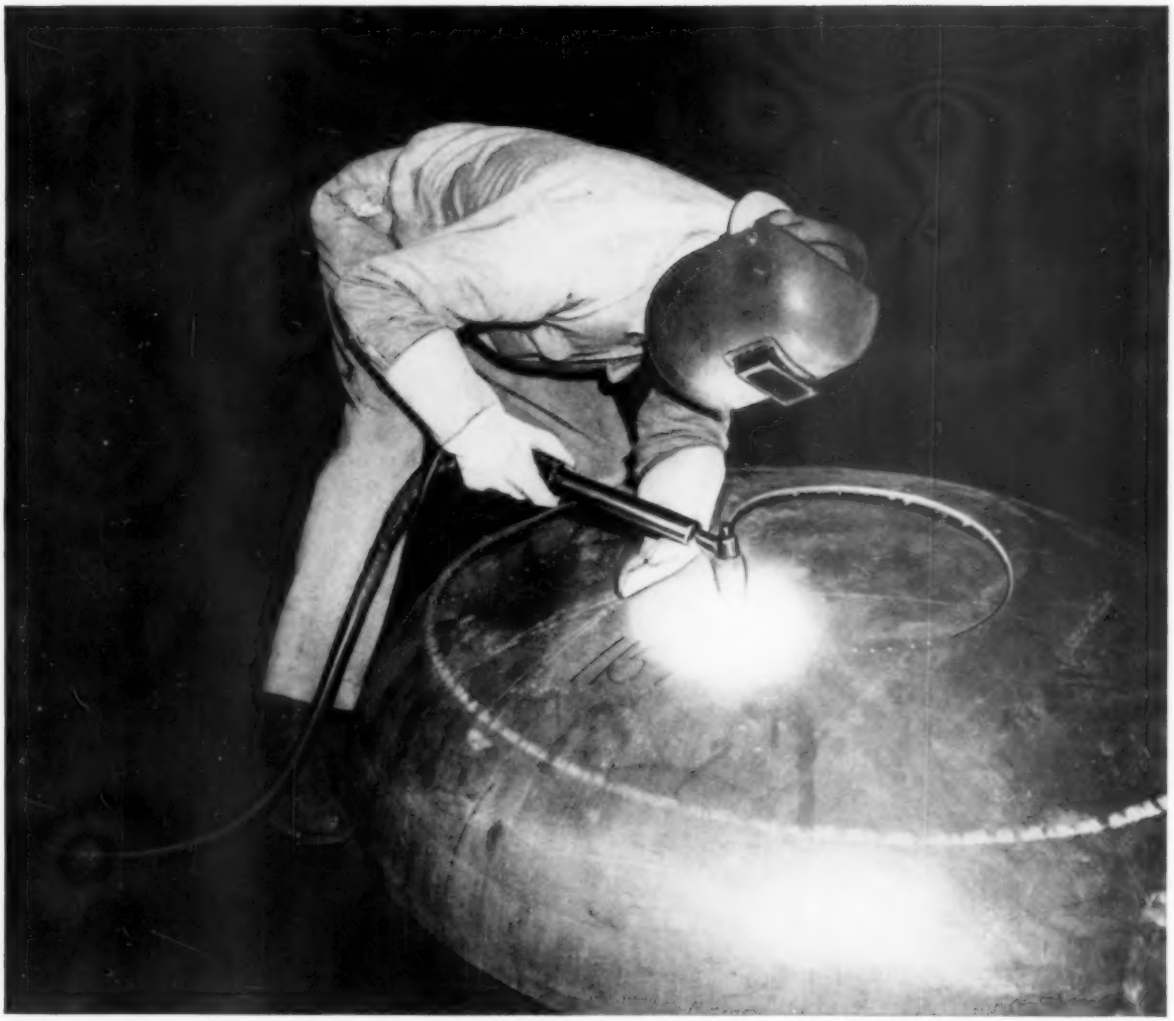

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A. J. FERGUSON SUCCEEDS C. H. Whitman (right) as crude buyer for Esso Standard's Refinery at Baton Rouge, La. He'll be . . .

Oil's New 'Million-Dollar-A-Day' Man

Some of the most harried men in the oil industry these troublous days are the men who buy the crude to keep the country's refineries going.

It's the job of a crude buyer to locate, and buy if he can, the crude needed by his company every day.

But today these buyers have to compete with a tremendous rush of purchase offers from Europe. And many U. S. refineries that previously were dependent on foreign fields for some of their supply also are turning to domestic producers for additional crude. The scramble is on, but good.

Until a few days ago, the country's largest crude buyer was C. H. Whitman, known throughout the industry as the "million-dollar-a-day man." Whitman spent that much to buy more than 300,000 b/d for Esso Standard Oil Co.'s refinery at Baton Rouge, La.—the nation's largest.

Whitman, 64, retired Dec. 1 after almost 42 years with Esso, the last 19 as a crude buyer.

Whitman was somewhat of an oddity among purchasing agents, in that he never saw the product he purchased, never haggled with a salesman across the desk, and never worried about budgets.

His chief operating tool was the telephone. Each day he would place dozens of calls from his desk at Shreveport to various producing areas in a four-state area (Louisiana, Arkansas, Mississippi, and Alabama).

His memory, sharpened by years of practice, was one of his chief assets. In addition to knowing most of the producers, Whitman could remember by name and size all of the fields in the states in which he bought oil.

Whitman's successor, A. J. Ferguson, has been carefully groomed for the big post. For the last few months, he worked side-by-side with Whitman, learning the complex details that make up his job.

The Baton Rouge refinery usually has close to 4-million bbl. of crude in storage or in transit to it—which gives some idea of the problems Ferguson faces.

Since March, 1955, when he was named assistant manager of the crude purchasing department, Ferguson has dogged Whitman's every step.

Ferguson joined Esso in 1938 as a process engineer. He worked his way up through various jobs until 1951, when his real training for the present post began, as assistant division purchasing agent.

Crude buyers do more than compete with each other for available supplies. They also are often sellers, or traders of crude.

Whitman had a situation not long ago involving 10,000 b/d of Oklahoma crude that an Esso affiliate found on its hands when a refinery cancelled a purchase contract.

Whitman could have solved the affiliate's problem by buying its surplus—but there was no pipeline from Oklahoma to Baton Rouge.

After three days, and several dozen long-distance calls, he worked out a neat triple play. An Ohio company took the Oklahoma crude, which could be shipped to it by pipeline. It, in turn, gave an equivalent amount of West Texas crude to a refiner in that area. The Texas refiner turned over southern Louisiana crude to Whitman near a pipeline that led to Baton Rouge.

Everyone involved profited by the juggling because of savings in transportation costs. The deal underscored one of Whitman's favorite sayings: "No deal is worth a damn unless both sides make a profit."

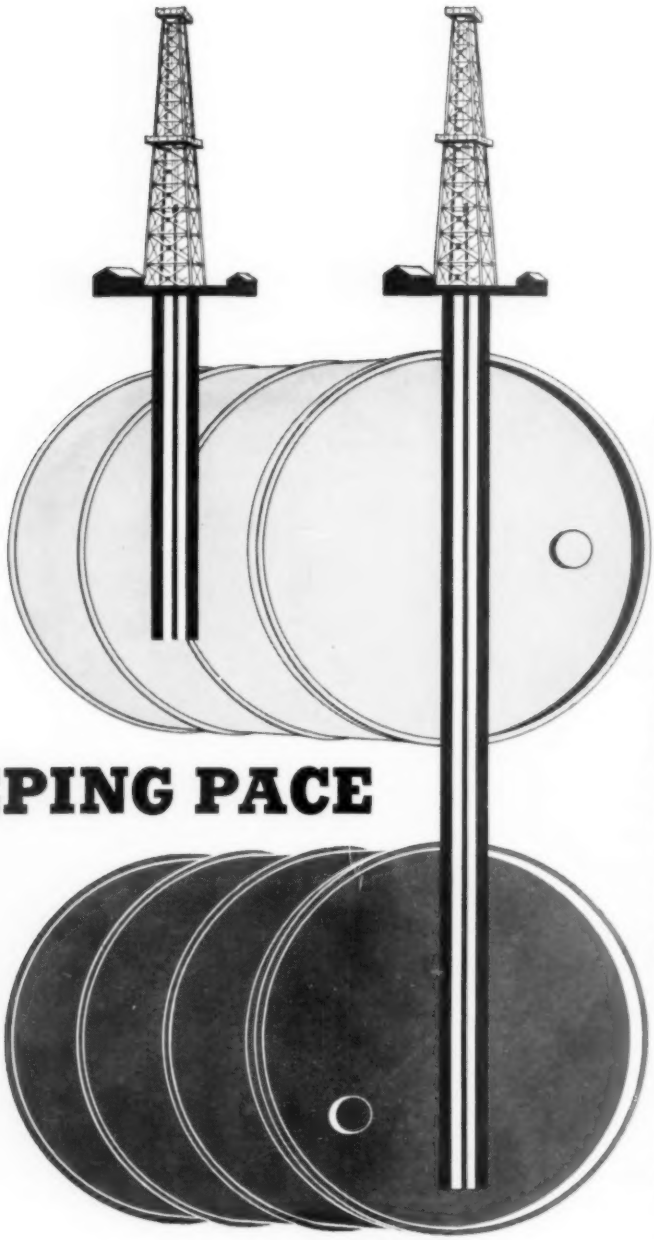
Crude buyers generally seek crude sources near the refinery, to cut transportation costs. And, wherever possible, pipelines are preferred because of the economy factor.

An important phase of Ferguson's apprenticeship was learning to spot a new source of oil even before a new field became a reality.

Esso buys about three-fourths of its crude from large producers, many of them companies affiliated with Standard Oil Co. (N. J.). The other 25% of the oil is bought directly at the well, mostly from small producers.

All crude buyers are price experts. A bid of even a penny more than competitors offer may be too much. This means, too, that the crude buyer must have expert knowledge of transport means, costs, and routes.

Whitman has played the game a long time; now Ferguson gets his chance. And he'll need all his training in the rough days just ahead.



KEEPING PACE

Drills were chewing their way down for about 2000 feet in the search for oil in 1916. Today's drilling depth is more than double that.

The change in drilling that forty years has brought well symbolizes many advances in the petroleum and chemical industries. Engineers have dug more deeply into the secrets of nature, too . . . have designed plants and processes to wrest new products and services from petroleum, ores and elements.

We mentioned 1916 because that is the year Sun Ship was founded. It has long served the swift-growing needs of petroleum and chemical industries. Year by year, the engineering skill and facilities of the great Sun Ship plant have proven their ability to meet the demands for plant and equipment keyed to the swift pace of progress in these and other important fields. Sun Ship keeps pace with progress.

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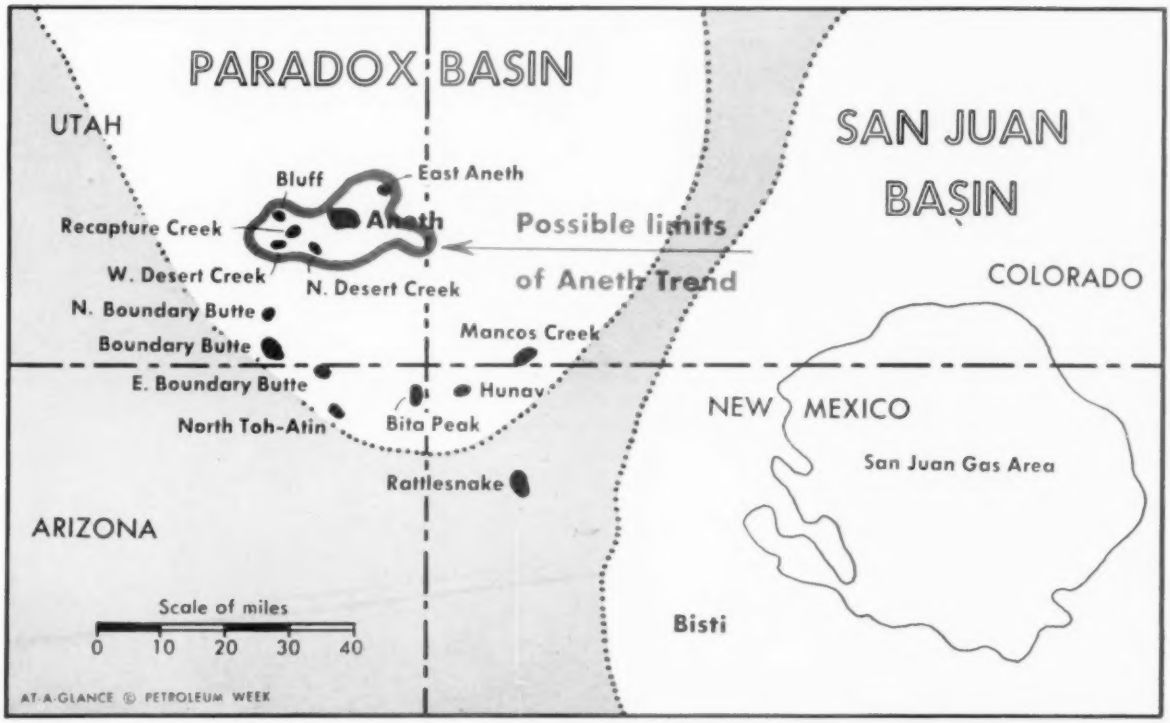


ANETH TREND is focal point of current drilling in the booming Four Corners area. Weather has cut activity, but next spring . . .

Drilling Will Soar in Four Corners

Come next spring, the Paradox and San Juan Basins in the booming Four Corners area are likely to have the heaviest concentration of drilling rigs since Scurry County and Spraberry at the turn of the decade.

A score of rigs are active in the region now. There would be more were it not for the severe winter conditions that grip the intersection of Utah, Arizona, New Mexico, and Colorado (map).

The comparatively few rigs operating presently, however, are bringing in new oil and gas producers at a whirlwind rate. New areas are being opened up, others are being extended, in what oil men now describe as one of the most important oil developments in this country in almost a decade.

The new discoveries and extensions mean that an even heavier swarm of drilling rigs will buzz into the area when warmer weather returns.

The coming rush in drilling activity will touch off a particularly heavy demand for portable intermediate-depth rigs. A great number of these were used in Scurry County in the late 40s. Most of them moved over to Spraberry in the early 50s. But when that development ended, there was no other area active enough to take up the slack. There hasn't been enough work to go around since then to keep the majority of these rigs operating. This has created a surplus of such rigs, which has been hanging over, and depressing, the drilling industry.

Heavy wildcat and development drilling is certain in the San Juan County (Utah) sector of the Paradox. This includes the Aneth trend, newest Cinderella of the oil industry.

As of last reports, there were 19 completed wells in the Aneth pool proper. Extensive wildcat drilling in the area has led to three more discoveries that may be either extensions or new fields.

Aneth was discovered by The Texas Co. No. 1 C Navajo, section 23-40s-23e, on Feb. 20, 1956. Completion was for 1,750 b/d from perforations at 5,828-74 ft. in the Paradox (Pennsylvanian) formation. The discovery led Texaco into an immediate drilling program to hold expiring leases in the area. (Texaco, Shell Oil Co., Superior Oil Co., and Gulf Oil Corp. were the only leaseholders in the immediate area of proved production until last month's Navajo lease sales.)

It could be that Texaco has another Slaughter pool, which is the largest in area in the Permian Basin of West Texas and New Mexico.

This pool, which Texaco discovered in 1936, covers 85,765 acres and has approximately 2,500 wells.

Aneth's present proved production runs about 8 mi. on an east-west trend and about 4 mi. to 5 mi. north-south. Oil men say that, on 40-acre spacing, between 1,000 and 1,500 wells can be sunk in this area. But 80-acre spacing is more likely.

And Aneth is only one of several productive oil and gas areas found within the Paradox Basin this year.

More than eight wildcat discoveries were chalked up in the first ten months alone. Some of the new pools that have been discovered, such as Recapture Creek, North Desert Creek, Bluff, and East Aneth may eventually prove to be connected.

The possibility of discovering other "trends" has kindled the splurge of exploration and drilling. More than 20 seismographic crews have been active in the Basin at one time,

NAVAJO Indians' eight-sided Tribal Council building at Window Rock, Ariz., was headquarters last month for three big lease sales of tribal lands in the booming Four Corners area. Picturesque murals decorate the walls.

though activity has eased up recently because of winter.

Every major company in the nation is represented in present drilling, in plans to drill, or in important lease-hold acquisitions in the Paradox.

Companies that have established production in the basin to date include Texaco, Shell, Carter Oil Co., Western Natural Gas Co., Three-States Natural Gas Co., Superior, Gulf, Aztec Oil Co., and White Canyon Mining (controlled by Texas-Zinc Minerals, affiliate of Texaco, and New Jersey Zinc).

Reserve estimates for Aneth alone run from 100-million bbl. up to more than 320-million bbl.—despite the fact that the field is not yet delineated.

A major company spokesman says that Aneth "may rank among the largest oil pools found in the United States."

Most of the drilling has been on Navajo tribal lands, with discoveries running through townships 40 to 41 south, ranges 22 to 26 east. Potentials range from 400 b/d to 1,800 b/d, of 40-gravity to 42-gravity oil. All wells are flowing, with average gas-oil ratio running 800:1.

Drilling problems have been minor, with average drilling time to 6,000 ft. being 45 days.

Moving production to market is, and will continue to be, the big problem. Development drilling will be held in check, or slowed, until this is solved. Some plans for new outlets are already in the works.

Aneth itself is located 45 mi. from the nearest paved road, and is in the center of one of the most primitive areas of the country. Steep rock bluffs, sandy rolling hills, and arid soil mark the area, making roads and location a costly proposition (PW—Dec.30'55,p13).

Service is only a few hours away, as long as rain or snow doesn't completely close the main road. Major service companies have set up branch offices in Cortez, Colo.

Development drilling is being discouraged further because no significant market outlets for any great volume of oil have yet been established. A small amount of the crude has been going to El Paso Natural Gas Co.'s 3,000 b/d refinery at Prewitt, N.M. Another 2,000 b/d or so is being moved by truck and tank car to Utah Oil Refining Co.'s plant at Salt Lake City (PW—Jul.13'56,p16).

Three pipelines out of Aneth and the sister San Juan Basin in New Mexico and Colorado are being discussed, planned, engineered, and debated (PW—Nov16'56,p32). Shell and Standard Oil Co. of California want to link the Four Corners to Los Angeles. Pacific Northwest Pipeline Corp.'s Northwest Production Co. wants to go to Salt Lake City. And Texaco—proposes still another direction—to the Texas Gulf Coast, via a tie-in with existing crude lines in New Mexico.

Durango, Colo., already bursting at the seams from San Juan Basin developments, is now "sliding down

ISOLATION and desolate, arid terrain in the Four Corners area is evident at this small outpost of civilization, marked by a pumping well and a lease tank. Lack of water, bad roads, and communications are the big problems.

PORTABLE RIG drills wildcat in San Juan County, Utah, as Navajos look on.

SEISMOGRAPH crew from Carter Oil Co. pushes through rugged country.

TEST SHOT spews sand high into air. Crews are idle now because of weather.

the mountainside" under the impact of the Paradox boom. Cortez, nearer the Utah line, also is growing as a headquarters.

Oil men estimate more than 500-million bbl.—in 13 different pools of gas and oil—have been proved in San Juan County, Utah, and Apache County, Ariz., since 1948.

The discoveries were led off by Western Natural Gas and the late P. B. English, who found oil in the Coconino (Permian) and natural gas in the Hermosa (Pennsylvanian) at Boundary Butte.

Since then, these hits have been made:

- Shell-Franco-Western, North Toh-Atin, Apache County, 7,450,000 cu. ft. of gas daily in Hermosa.
- Shell, East Boundary Butte, 3,150,000 cf/d of gas in two intervals in Upper Hermosa.
- Shell, North Boundary Butte, 380 b/d and 2,670,000 cf/d in Upper Hermosa and 123 b/d and 1,565,000 cf/d in Paradox.
- Three-States-Shell, Bluff Unit, 168 b/d in Upper Hermosa, and 135 b/d in Paradox.
- Shell, Recapture Creek, 408 b/d in Upper Hermosa.
- Shell, North Desert Creek, estimated 1,440 b/d in Paradox.
- Gulf, West Desert Creek, estimated 1,080 b/d in Paradox.
- Texaco, East Aneth (or Hovenweep) 400 b/d in Hermosa.
- El Paso Natural Gas, Bita Peak, Apache County, 13-million cf/d in Paradox.
- Texaco's original discovery well, Aneth, 1740 b/d in Paradox.

Many of the gas discoveries on the south rim of the basin, in San Juan County, Utah, and Apache County, Ariz., make considerable amounts of distillate. So does the early find by English, et al, at Dove Creek, Colo., on the northeastern rim of the basin.

Most of the production in southeastern Utah is in Hermosa or Paradox (or both) formations of Pennsylvanian age. Other oil and gas shows (and production) have been established in the Coconino (Permian) and Mississippian section.

Pay thickness in the Paradox varies from 30 ft. to more than 65 ft. But saturation of oil in the dolomite limestone has run as much as 145 ft., though not all of the saturated zone was capable of being produced.

Geologists believe that both structural and stratigraphic conditions control deposition of oil and gas in the basin.

One reason for the scanty geological information, in Aneth particularly, is the reluctance of some companies to make available information that has cost them heavily. "It's just too early to expect full disclosure," says one geologist of a major company.

Counting the Hermosa as part of Aneth's Hermosa-Paradox trend, there is speculation that the over-all trend may extend more than 25 mi. on an east-west axis and 10 mi. to 15 mi. on a north-south axis.

It is on this basis that various pools

in the area may be interconnected. Drilling now under way may establish this relationship.

The Four Corners portion of the gas-rich San Juan Basin, most of which lies in New Mexico, also is the scene of heavy drilling play, topped by the Bisti field.

The Bisti area now has more than 60 producing oil wells, where only a few years ago there was little more than desolate, dry wasteland.

While oil has been produced in the San Juan Basin for more than a quarter of a century, it has been in relatively minor quantities. During the postwar drilling boom, which received new impetus with completion of El Paso's pipeline to California, oil production played second fiddle to exploration and development of natural gas fields in the area.

El Paso's refinery at Prewitt, N.M., will be augmented next fall by another El Paso refinery at Ciniza, N.M. This 6,500 b/d refinery is expected to take on increasing amounts of Four Corners crude, and will be built so that it can be expanded to meet increasing requirements of the region. At the rate new discoveries and extensions are being made in the Four Corners, it's more than likely the crude available will continue to exceed refining capacity.

The Bisti discovery well was El Paso Natural Gas Co. No. 1 Kelly State, section 16-25n-12w, on Oct. 7, 1955.

The well was completed for 180 b/d. Another zone was perforated and sand-oil fractured months later. This zone was recompleted for 466 b/d, flowing.

The El Paso strike was followed quickly by several others.

British American Oil Producing Co. No. 1 Marye, section 1-25n-13w, came in as a discovery and was completed for 648 b/d on Apr. 17, 1956.

This well caused another quick step-up in development by British American, El Paso, Amerada Petroleum Corp., Phillips Petroleum Co., Sunray Mid-Continent Oil Co., Shell, and several independents via farmouts.

Production in Bisti is from the Gallup sand in the Mancos shale, Cretaceous age. Completions are in from two to four zones.

Operators generally set 5½-in. casing, perforate the lower zone, sand-oil frac it, set a bridge plug, perforate, frac, and so forth up hole through the two to four possible producing zones.

Potentials run from 30 b/d pumpers to 1,000 b/d flowing wells.

There now are 61 producers in the field (as of latest reports). Another 12 wells are in the testing stage, and another 5 are now drilling.

One reason why Bisti has touched off so much drilling is the exceptional success ratio compiled by some operators. Sunray, for instance, drilled its first well in Bisti in April, completing it for 360 b/d. Through mid-October, Sunray had completed 20 more, without a single dry hole.

Fringe completions have been salt water failures. There are 17 to 24 dry holes in the general trend area, which were drilled from 1 mi. to 12 mi. from production.

The marketing problem is the biggest limiting factor in development of this field also, right now.

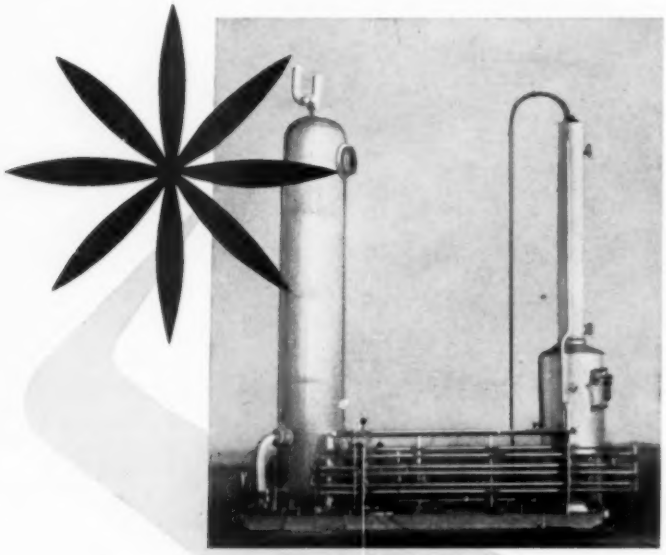
Because of the market limitations, the wells have been assigned an allowable of only 26 b/d, with each new well cutting this down.

Though the area has been fairly well defined, it still costs around $40,000 to drill a dry hole and about $55,000 to complete a flowing producer. The multiple fracture treatments account for much of the outlay.

The field is located about 18 mi. to 20 mi. from a paved road. The area is extremely sandy, and access roads generally are in very poor condition during drilling.

Water, too, is a problem. Most of it must be hauled to the drillsite.

Otherwise, though, drilling problems are minor—another reason why rigs will be in heavy demand again when the weather eases.



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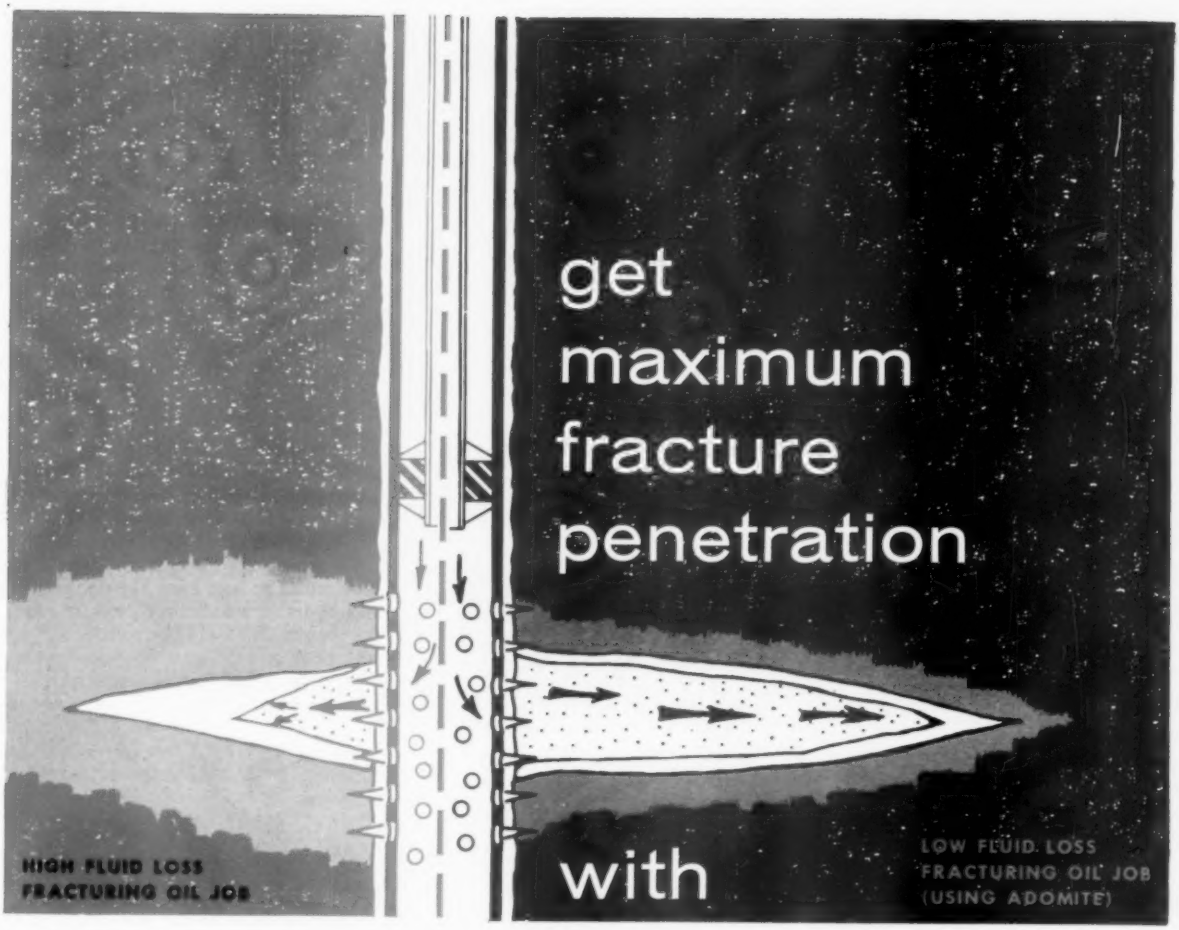

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Sohio's Waterflood Gives New Life to

MICROFILM LOGS of old wells are studied for waterflood possibilities by Sohioans S. Maples (standing) and P. Luckhardt.

WATER for the Bald Hill flood is filtered, then pumped into injection wells by these units, being checked by Woodrow Brown.

The success that Standard Oil Co. (Ohio) has had with its Okmulgee waterflood is boosting interest in such projects for other old fields in Oklahoma.

Waterflood operations now produce about 17% of the state's oil. Production from this secondary recovery method is expected to increase to about 25% of the state total within ten years.

Sohio already has touched off increased competition in the Okmulgee area, in east-central Oklahoma.

Sohio's Bald Hill Pool has produced more than 1-million bbl. of oil since waterflooding first began on an experimental basis in March, 1954.

Company engineers estimate that Sohio will get more oil in nine years of waterflooding from the one section of the field under flood than was produced in all the 44 years previous.

They add that the field already has paid the cost of exploration and development and should show a substantial profit in coming years. This helps explain the keen interest other oil companies are showing in the Sohio project.

Actual state of waterflood operations at Bald Hill was preceded by months of study and research.

Engineers and landmen had ransacked the area for months, searching for old production records, well logs, and other sources that would give them data about various pools. The

OPERATIONS foreman C. E. Armstrong talks with contract well service unit operator Bob Sinks (right) as crew pulls sucker rods during reconditioning.

PUMPER Clarence Ransbottom makes adjustments on one of many new pumping wells now producing from Okmulgee's Bald Hill Pool.

Bald Hill Pool

available data seemed to indicate that Bald Hill had good waterflood possibilities.

Core wells were drilled, and cores analyzed. Production crews then pulled tubing in nearly all of the old wells, running tests in most of them to determine potentially productive sand thicknesses.

By early 1954, reservoir engineering studies determined that the Booch Zone, at 1,200 ft., had good waterflood characteristics. A small experimental project was started.

The five-spot pattern was used, as in most such projects. In this pattern the four water injection wells are spotted in each of four corners. Water pumped down these wells moves the oil toward a producing well in the center.

The experimental project involved nine injection wells surrounding four producing wells. In this arrangement, some of the injection wells aid more than one producing well, though the five-spot pattern is retained.

To get water, Sohio engineers drilled below the producing zone to tap a salt water formation at 3,600 ft.

The producing wells began to show new vigor within five months after around-the-clock pumping had begun. The original output of about 7 b/d per well began to mount more swiftly after that.

Success of the experimental project led Sohio to go all-out. But most of the old wells were unusable, necessitating a 116-well drilling program.

Cable tool rigs were found best for reaching the shallow Booch Zone. The 116 new wells gave the field a final total of 159 wells—70 injection, 89 producers.

The flow of water was increased until 10,000 bbl. of water were being processed daily. Oil production climbed steadily to 2,700 b/d, then was cut back to 1,400 b/d by state proration.

Waterflooding is nothing new to Sohio, which has such projects going in Illinois, Michigan, and Kentucky. A gas recycling project also is just moving into its productive phase at Eola, Okla.

Preliminary work at Eola began nearly a year ago, but actual recycling of the wet gas available in that area didn't begin until this spring.

And in addition to Bald Hill, Sohio has 2,360 Oklahoma acres under lease and options on another 2,000 acres, all of which are being considered for new waterflood projects.

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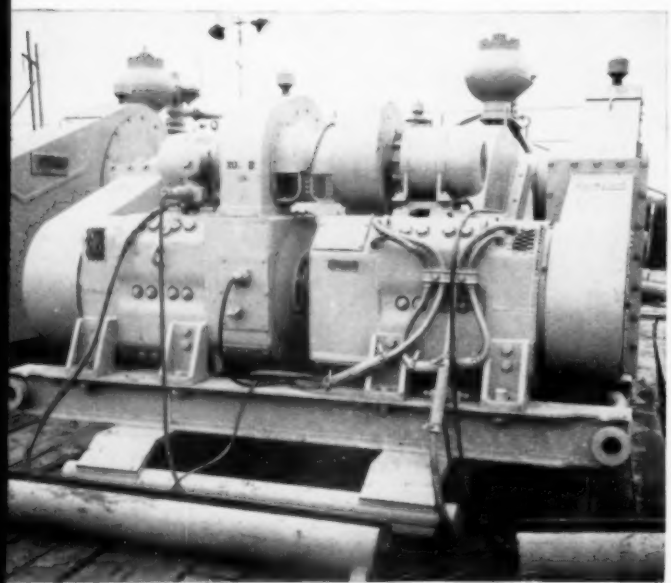
Three skid-mounted Electro-Motive Diesel generating sets rated at 875-hp. supply power for motor driven pumps, rotary table and draw works. Each unit is complete with two 500-kw generators, controls and cooling system.



Drive motors are 625-hp. direct current type for smooth, rapid acceleration of loads and positive control of speed and torque. Each main pump has two 625-hp. motors for a total horsepower rating of 1,250.

Simple, flexible conductors connect generating sets to drive motors, allowing complete flexibility of arrangement. Rig-up time is reduced considerably because components are located to fit the site.

It's Diesel-Electric for Shell on Cote Blanche Island

Portable, rapid-setup Electro-Motive Power choice for big rig in rugged Louisiana swamp

To work the swampy Cote Blanche Island field, Shell Oil Company faced two opposing requirements for their Rig 11. First, the rig had to be big, with power to drill over 18,000 feet. And second, it had to be easily portable to enable movement over primitive roads.

Shell's decision to use Diesel-Electric was influenced by the fact that this type power permits gathering almost all equipment into easy-handling, skid-mounted packages. In spite of rough terrain, rig-up can be completed in record time.

Electric conductors running from generating units to drive motors provide flexibility in locating equipment to suit conditions. This design avoids clutter, reduces rig-up and rig-down time and makes a big rig far more economical to move. Also, with few modifications, equipment can be adapted for offshore drilling.

Three Electro-Motive SR-8, 875-hp. Diesel generating units driving nine 625-hp. d.c. motors provide the drilling power for Rig 11. Its first hole is scheduled for 18,500 feet, using a 14,000 foot, 9⅝ in. protective string. It takes big power to drill below the overhang of the salt dome in this area, and this rig has it.

Electro-Motive Power is adaptable to many different types of drilling devices on land or water. For complete details on how it might fit your own particular requirements, get in touch with your Electro-Motive representative.

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Driller's control is located next to draw works. From a central position, driller has complete control of Diesel-Electric equipment, including engine speed, pumps, hoist, rotary table and safety shutdown.

Derrick on Rig 11 is a big one—147 feet. It was modified for platform drilling, but can be extended to 189 feet. In spite of size, the rig is highly portable. Skid-mounted equipment gathers into easy-handling packages.

What's New / IN EXPLORATION, DRILLING, PRODUCTION

Drilling Test Under Way

A research project at a deep well being drilled in Ector County, Tex., may result in better and cheaper methods of drilling.

The American Assn. of Oilwell Drilling Contractors, in cooperation with several companies, is conducting a series of tests to determine the relationship of drillbit speed and weight to penetration.

The tests, expected to take about eight weeks, consists of keeping a round-the-clock record of all drilling functions on the rig under varying conditions. The functions are being recorded, in graph form, by electronic instruments (built by Martin-Decker Corp.) at a remote location.

Site of the project is a Texas Gulf Producing Co. 13,500-ft. test being drilled near Dora Roberts pool, 6 mi. southwest of Odessa.

•

Rangely Unit Mapped

Operators in Colorado's Rangely field have reached agreement on major provisions for unit operation. Unit and operating agreements for the formation of a federal unit are now being drafted.

Some 22,000 acres are involved in the proposed unit. Of this total, 9,000 acres are public land. The unit, when formed, will be under the supervision of the U. S. Geological Survey—as is any federal unit. All acreage is participating.

The California Co. will be unit operator. Four other companies are major operators at Rangely—Stanolind Oil & Gas Co., The Texas Co., Sharples Oil Co., and Union Pacific R. R.

The Colorado Oil & Gas Conservation Commission has been urging unitization to increase ultimate recovery and reduce waste of natural gas (PW—Aug.3'56,p17).

•

Test Sonic Drilling

Experiments on sonic vibration techniques in drilling are being conducted at Battelle Institute, Columbus, Ohio, under the sponsorship of Drilling Research, Inc.

The experiments are aimed at determining the potentialities of drilling by vibrating a bit at hundreds of cycles per second and, thus, delivering more mechanical energy to the rock.

A Battelle official reports that the research center is now perfecting a transducer for deep-well drilling. The power unit is designed to vibrate a 10½-in.-diameter bit at a frequency of about 300 cps., and to follow the bit down the hole. The transducer itself is about 25 ft. in length.

The transducer is mounted in the drillstring between the bit and drill collar. A filter isolates the vibration of the transducer from the rest of the drillstring through an electrical conduit—mounted concentrically in the drillstring.

The latter is rotated in the same manner as in conventional rotary drilling.

•

Agree on Offshore Taxes

Offshore oil operators and the state of Louisiana have tentatively agreed on a settlement concerning state taxes on tidelands drilling equipment.

The pact will now go to some 80 tidelands operators (zones 2, 3, and 4) for ratification—which is expected.

In effect, the pact calls for operators to agree to pay—within 90 days after settlement of the offshore boundary dispute between the U. S. and Louisiana—all past, present, and future taxes on rigs, and other equipment, in the territory adjudged to belong to the state.

In turn, Louisiana agrees to waive all interest penalties and attorneys' fees involved.

The agreement would hold in abeyance Louisiana's collection of property taxes and suspend the ad valorem tax laws of the state, insofar as they affect tidelands operators.

•

The biggest production wells in California's San Joaquin Valley may produce even more oil—if Union Oil Co. of California is successful with its newest pilot waterflood in the Coalinga field.

Union—as operator for the Coalinga Nose unit, Fresno County—currently is deepening two edge-of-the-pool wells to be used for water injection of the main Gatchell (Eocene) at 8,000 ft.

Plans are to inject between 3,000 b/d and 4,000 b/d of water.

The unitized pool presently produces about 44,350 b/d of high-gravity oil, with production per well averaging 434 b/d.

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Saskatchewan now is authorizing some wells to be dually completed, wherever it's economically sound.

J. H. Brockelbank, of the province's Dept. of Mineral Resources, says the department does not favor authorizing such completions "except where it may be shown that it is uneconomic to do otherwise. But there are cases where it may be in the public interest."

Twelve of the 2,281 oil wells in the province are now dually completed. Most recent authorization was to Anglo Exploration, Ltd., for an oil well in the Hastings field, in southeastern Saskatchewan.

•

Drilling slowed down in Illinois last month, according to the state's November drilling report, issued this week.

The report says 257 wells were completed last month, an average of 64 per week. This compares with an average of 73 per week in October. The 257 completions included 103 oil wells, 5 gas wells, 76 pool dry holes, and 73 dry wildcats.

One wildcat discovered a new oil pool, Hornsby South in Macoupin County, during the month.

•

A 6,000-maximum-hp. diesel electric power plant—most powerful ever designed for an offshore drilling rig—is being assembled in Houston by Stewart & Stevenson Services, Inc. It will be used on "Mr. Gus II"—a giant mobile platform designed for ultra-deep-water operations. Mr. Gus II is being built in Beaumont by Bethlehem Shipyards for C. G. Glasscock Drilling Co., Corpus Christi.

•

An-Son Gulf Drilling Co. is building a $1-million diesel electric off-

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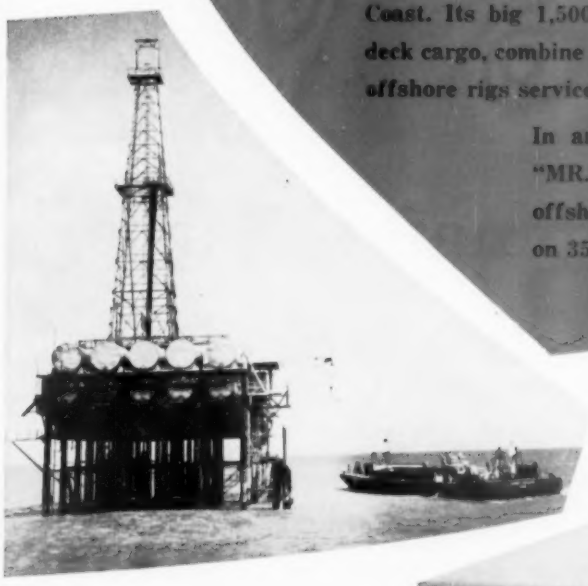

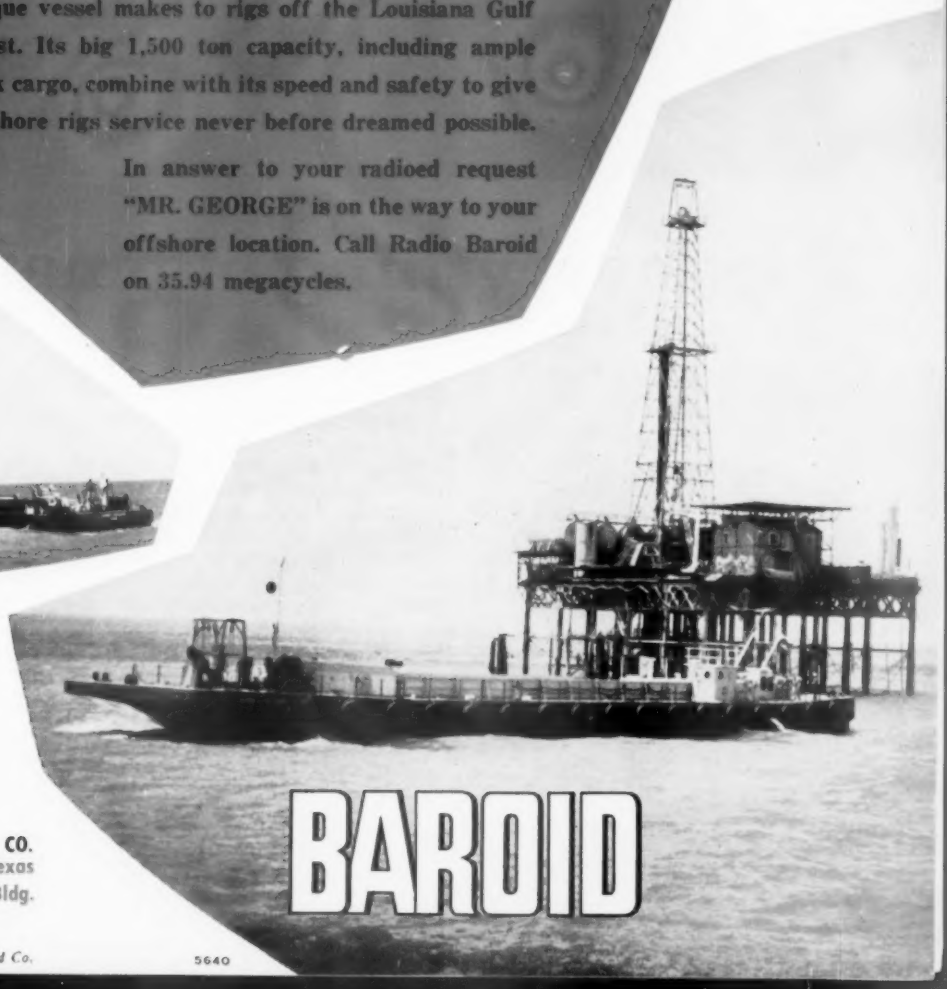

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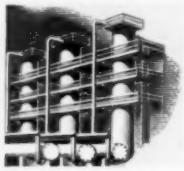
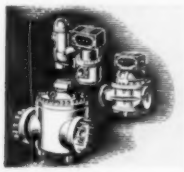
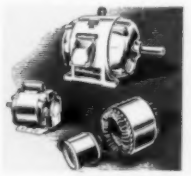
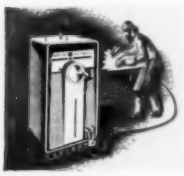

Pressure vessels, heat exchangers

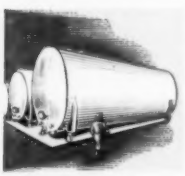
Line pipe, oil well casing

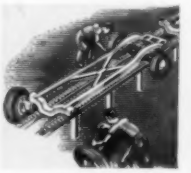

Liquid meters, gasoline dispensers


Electric motors


Welding machines, electrodes, accessories

Permaglas smoke stacks


Glass-lined and stainless tanks


Automotive frames and parts

Glascote processing equipment

shore drilling tender for service in the Gulf.

Equitable Equipment Co., New Orleans, is the contractor.

The tender will be designed to be used with a minimum-type platform. It will be approximately 250 ft. long, 50 ft. wide, and 15 ft., 8 in. in depth.

The tender is expected to be completed in August, 1957.

•

Dowell, Inc., of Tulsa, has developed an expanded-steel "fence," which, in a circular form, holds polyethylene plastic film to store water above ground for "Riverfrac" jobs.

Dowell recently reported it was using plastic-lined, "scooped-out" holes in the ground as a cheap means of storing water for the fracturing jobs. The circular, expanded-metal "fences" eliminate the cost of scooping out the holes in the ground.

The new "Fraktanks" are easy to assemble, and can be hauled anywhere. They hold 50,000 gal. of fluid, and can be set up in about four hours.

•

A total of 56,000 acres of Montana state school lands will be leased at Helena Dec. 19. Leasing will be by oral auction.

The offering of 145 tracts is spread through 24 counties, including Sheridan and Daniels, in the northeast corner of the state, scene of recent oil strikes.

•

Drilling Highlights

Oklahoma—Panhandle Eastern Pipe Line Co. No. 1 Wilson, section 23-4n-13w, has been completed as an oil and gas discovery, flowing 3,500 b/d and more than 5-million cu.ft. of gas daily. The well, in the Fox Block area of the Hugoton field, Texas County, is producing from lower Morrow, perforated at 6,441-72 ft.

In Love County, The Texas Co. No. 1 Westheimer, section 17-7s-3e, 2 mi. east of East Marietta field, attempted to blow out in Oil Creek (Ordovician) lime at 8,785 ft. Drillpipe is stuck in the hole, but the test flowed 9.6-million cu. ft. of gas daily with 182 bbl. of condensate in 20 hours after packer was set at 956 ft. below surface casing, which is only casing in hole.

Colorado—Malco Refineries No. 1 Kowach, section 25-6n-90w, Moffat County, recovered 8,800 ft. of oil on 4½-hour drillstem test at 9,180-428 ft. The test interval spanned part of Chinle, all of Shinarump, and part of Moenkopi, but recovery is believed principally from Shinarump.

Texas Gulf Coast—Gulf Coast Leaseholds, Inc., will drill No. 1B A. P. George Estate as a 9,000-ft. Vicksburg wildcat on the south flank of South Thompson field, on a 2,000-acre lease in the J. H. Polley survey, A-7, Ft. Bend County.

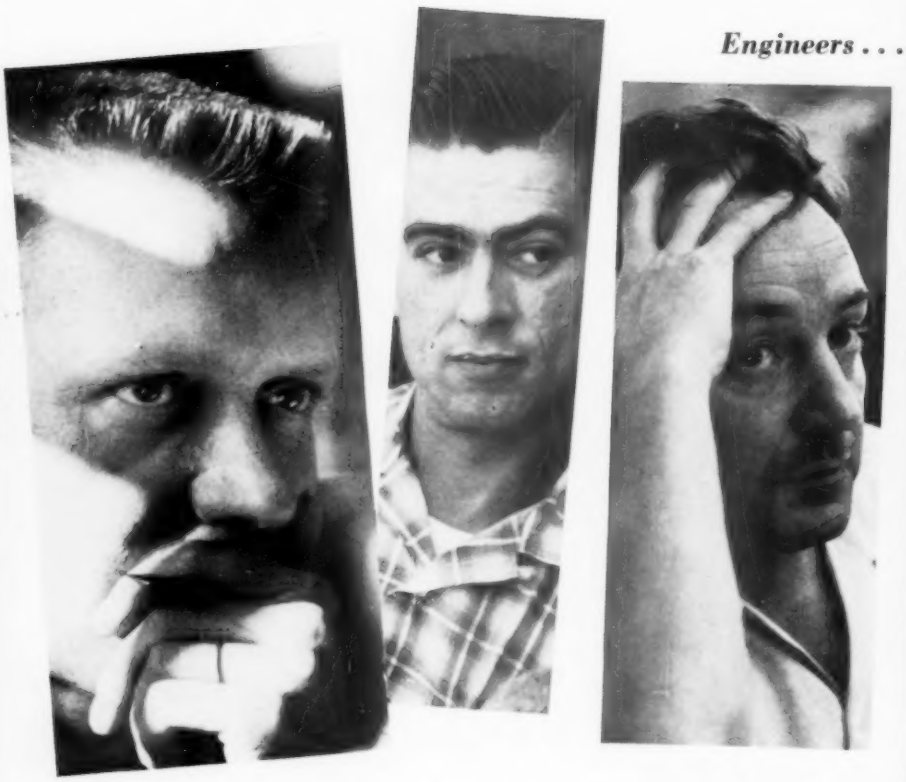
Offshore Louisiana—A new distance record for production off Louisiana's coast has been set with testing of Gulf Refining Co. No. 1A OCS-0589, block 176, Ship Shoal area. The test is about 47⅓ mi. south of Pointe au Fer, Terrebonne Parish. The wildcat tested for 1,780,000 cu. ft. of gas with traces of distillate on 50-minute flow. Up to now, the farthest offshore production, also a gas field, was in block 160, East Cameron area, about 42 mi. from land.

West Texas—Republic Natural Gas Co. No. 1 Arthur Duvall, section 1, block 3, H&TC survey, 2½ mi. southeast of the East Abell McKee and Waddell sand pool, Pecos County, has been completed as a McKee discovery. It flowed 43-gravity oil at the rate of 562 b/d from perforations at 5,490-530 ft. gas-oil ratio was 863:1.

New Mexico—Tennessee Gas Transmission Co. No. 1A State A. A. Kemnitz, Lea County, has flowed oil on two drillstem tests in the Permo-Penn lime. One test flowed 13 bbl. of oil in 16 minutes on 1-in. choke from 10,640-731 ft., and 157 bbl. in two hours when pinched back to ⅝-in. choke. At 10,737-63 ft., the test flowed 27 bbl. in 20 minutes on 1-in. choke, and 155 bbl. in four hours through ½-in. choke. Drilling is continuing to a projected depth of 11,500 ft.

Texas Panhandle—A Tonkawa gas discovery has been made in Hansford County. The strike is Shamrock Oil & Gas Corp. No. 1F J. K. Steele, section 66, block 45, H&TC survey. The discovery flowed 980,000 cu. ft. of gas daily through perforations at 5,366-76 ft. after acidizing.

Southwest Texas—A gas distillate discovery and an oil strike have been made in Bee County. S. H. Howell et al No. 1 Ida C. Wood et al, H&GN survey, A-186, flowed at the rate of 9-million cu. ft. of gas daily, on open flow, from perforations at 4,009-16 ft. in the Chamberlain A sand. Howell et al No. 2 Ida C. Wood et al, same survey, flowed 30 b/d of 29.3-gravity oil through 7/64-in. choke from perforations at 4,008-14 ft.



BRAINSTORMING

Viewed by some as an idea gimmick that ignores individual thinking, brainstorming nevertheless is winning a permanent place in many oil company programs. Reasons: It shows men how to get ideas: it's a springboard for advanced creativity.

Brainstorming today is passing out of the experimentation stage. Some oil companies are now assigning it the permanent job of teaching employee groups how to get ideas. And from now on, it may start unlocking doors to new creativity for the individual oil man.

The significance of brainstorming for both majors and independents, and for their managers, lies in the growing complexity of the oil business. A flow of new ideas that provides a "thinking edge" over competition is more vital today than in the slower-paced past.

Brainstorming, or group-thinking, is far from the total answer. But when properly staged, it rarely fails to produce a wealth of ideas.

In simple brainstorming, a group of six to twelve people think of as many ideas to solve a problem as possible. "Wild" ideas are encouraged and no criticism is allowed (a key factor, since it eliminates the fear that an idea will be ridiculed). The system frees the imagination, and allows the ideas of one person to trigger ideas from others.

The man responsible for much of the industry's progress in brainstorming is Charles Clark, of Ethyl Corp. (picture, page 36). This week he made his 100th brainstorming presentation since February, 1955. He and the assistants he has trained at Ethyl have staged 118 brainstorming sessions at oil companies in the past year and a half, and another 72 outside the industry. Clark's work has been an important stimulus to oil company thinking about creativity.

I. Who Is Using It

Typical of the growing application of brainstorming by oil companies is its use in Shell's "Idea Program" for salesmen. Many Shell sales dis-

scientists . . . construction men at Tidewater Oil Co. wrestle with "advanced brainstorming."

Evolves as a 'Fad' with a Future

tricts in all parts of the country hold regular sessions, on such subjects as how to display products at the station pump island.

The meetings follow the regular rules for brainstorming. They are attended by salesmen only, without the "boss" (district sales manager or sales supervisor). The results are routed through division offices to New York headquarters.

California Standard has incorporated the technique into a supervisory training program at its Richmond refinery.

The company's safety men like it and see it as a way to get new life and thinking into meetings. Socal is also considering how it can be combined with "work improvement" as part of a new training program.

A recent session of the Esso Research Club brainstormed 750 ideas on how the U. S. can use its technical manpower more effectively. Ideas ranged from more use of computers to "more talcum powder to make slide rules work better."

Brainstorming continues to grow outside the oil industry, too. More than 65 large U. S. corporations use the method in one form or another. And it's getting growing attention in the public press.

II. The Pros and Cons

As viewed by creative thinking specialists, brainstorming today is suffering from the effects of too much publicity. Some oppose its emphasis on group idea-making. One specialist sums up the criticism this way: "We have found two main drawbacks to brainstorming.

"First, it is superficial. Although highly useful for such fields as advertising or sales, it has little value for difficult operational or research problems.

"Second, it tends to postpone individual thinking, and to encourage reliance on group thinking exclusively."

But proponents of brainstorming say it shouldn't be dismissed as merely a gimmick. Says Ethyl's Clark, "We aren't saying that brainstorming is the whole answer to creativity, or anything like that. But the interplay of thoughts in a group often produces better ideas than an individual could."

"Sometimes overlooked," Clark adds, "is the great value of brainstorming as a quick idea-collection device."

Its greatest future value may actually be as a catalyst to individual thinking. "Basically," Clark observes, "brainstorming is a method to teach people to think by themselves. No one can go through a session without having a better idea of what builds creativity."

This month Clark began a study of the potential in "one-man brainstorming"—in which the individual lets his own mind run free, and writes down all ideas, as in regular brainstorming.

A recent development is "brainstorming for problems" (to uncover obstacles to an intended course of action).

Another is "double brainstorming," which has shown good results. In this, the first part of a session is devoted to a general, or "steam-shovel" question. Example: How can we increase crude reserves?

The second part concentrates on one of the answers to the general question. Such a restricted, or "spade," question might be: "How can we improve offset drilling to increase reserves?"

III. The New Approaches

A sign of the future paths brainstorming may take is the "advanced brainstorming" technique tested this

SAMUEL TRULL, management consultant who presented "advanced brainstorming" course for Tidewater's middle management. Working with two associates, W. R. Poindexter and Donald Kennedy, Trull spent two years developing the technique. It was then successfully tested on groups of PhD-level scientists doing electronics work for General Electric. He and Poindexter now have their own consulting firm, Operations Services, in Berkeley, Calif.

fall by Tidewater Oil Co. The system is an evolution of simple brainstorming, developed by a management consultant, Dr. Samuel Trull, and two associates (industrial psychiatrist W. R. Poindexter and sociologist Donald Kennedy). Trull presented the method to 20 of Tidewater's middle management men from the Avon (Calif.) refinery (pictures). This was in ten weekly sessions of two hours each. Attending voluntarily were seven men from the research department, five from engineering, four from the control lab, and four from maintenance and construction.

By channeling the thinking in simple brainstorming, and following it up, the advanced method can produce detailed solutions to highly complicated problems. It has four, sharply-defined phases:

- **Orientation and Brainstorming.** The group chooses a problem, setting specific limitations on the area to be explored. Then a typical brainstorming session is held, with no criticism allowed. Ideas are recorded as words or phrases.
- **Elaboration and Categorization.** Next, the ideas are sorted out and classified under headings. The group works over the material—as Trull puts it, "pushing, punching, warping, poking, cutting the material one way and then another, not evaluating but exploring."

It is this reworking and expanding, of "raw data," plus the new ideas that keep breaking through as the group works over each batch of basic material, that make the system suitable for problem-solving on a highly technical level.

- **Selection and Planning.** Next comes the criticism of the ideas, followed by the decision on which solutions are valuable. Then a report is made on recommendations.
- **Evaluation and Feedback.** In the last step, the group reviews its actions. This amounts to a study of the mechanics of successful problem-solving that may be used in speeding the solution of future problems.

The Trull system makes heavy use of subgroups for intensive study of ideas.

Running each session are a "chalkman" (group leader working at the blackboard), a director (who sits with the group to guide and encourage it), and a recorder (who records ideas and methodology).

Trull says it is the "idea-recycling" feature of the system that avoids the shortcomings of simple brainstorming. He explains, "When we worked with brainstorming originally, we found we kept taking ideas out of people without putting anything back in. People weren't allowed to work over the ideas to see what could really be done with them."

In the system evolved by Trull, however, raw ideas are developed into finished recommendations that stand a good chance of being adopted. "Knowing that your thinking will at least be honored with serious consideration," Trull observes, "is a rewarding—and creative—experience."

Tidewater is now evaluating the advanced brainstorming course. It may continue the group as a "problem-solving task" force. Or men from the class may set up their own groups back in their departments.

Sums up Oscar Larsen, manager of Tidewater's Avon refinery, "It's too soon to know results. But the method shows men how to use the brains of others, as well as their own. And the men learn how to think problems through, from all sides, before suggesting solutions.

"The system also should help in forming interrelationship between departments. A closer-knit management group should result. And by working together, the men get a lesson in human relations."

Another modification of simple brainstorming is the "green light" session used by Indiana Standard in coordinating advertising and sales efforts. One such meeting brought together members of the advertising, sales, and sales promotion departments for a briefing of advertising agency men, who were largely listeners.

The session started with an agreement on Indiana Standard's marketing objectives. Next came a listing of more than 40 obstacles in the way of these objectives.

The group then brainstormed all the company's advantages in sales appeal, and came up with 86.

This was followed by a call for all ideas on possible advertising and sales promotion themes—and a response of more than 300 ideas.

Finally about a dozen of the best ideas for each principal product were screened from the total and presented to the ad agency for use in future ad campaigns.

Standard feels that the "green light" session produced a creative flow of thought from company people, without in any way restricting the

CHARLES CLARK, of Ethyl Corp., New York City, whose demonstrations of the brainstorming technique for oil companies have done much to further creative thinking in the industry. He originated "mass brainstorming"—in which large groups are divided into units of six, each holding its own session. He was introduced to brainstorming through work under Alex Osborn, a pioneer in the field. Today, Clark concentrates on "community service" showings of the technique.

agency's freedom to create its own copy ideas.

IV. Creating a 'Climate'

Brainstorming is important partly because of the assist it gives broader oil company programs aimed at producing a creative atmosphere. Explains G. W. Ritter, assistant superintendent of employee relations in Indiana Standard's Research Dept., "Brainstorming is part of the psychology of creative thinking. Over-all, we are trying to create an atmosphere in which no cold water is thrown on new ideas, and no thinking is held in conformity."

Standard's research department held a series of five two-hour sessions on creativity for supervisors. Goal was to make the men more aware of the factors affecting creativity, the importance of a positive approach in considering ideas, and the techniques for improving creative thought. (The department used brainstorming in presenting the program to 140 supervisors at Whiting.)

In the forefront of creativity programs is the plan recommended by Humble Oil & Refining's training division.

It calls for a free exchange of information, a minimum of work pressure, and a reduction of rigid controls. The program seeks to eliminate conditioned thinking. And it encourages men to take risks without fear of the consequences of failure.

Continental Oil is now studying companywide creativity as a "state of mind," rather than as a technique. Conoco recently sent four executives to a seminar at Massachusetts Institute of Technology for a creative engineering seminar, conducted by Prof. John E. Arnold. The men represented industrial relations, exploration, development and research, and manufacturing technical services.

Following the seminar, they got Prof. Arnold to spend three days talking with Conoco supervisory and management groups.

The Conoco men are now analyzing possible new programs in their departments.

In these programs, as in brainstorming, there is growing awareness that getting ideas is only part of the battle. As Ethyl's Clark puts it, "You need good ideas before you can go anywhere. But you also need people who will take the ideas and act on them. There is very little agreement on the best ways to use new ideas. It makes a good subject for brainstorming."

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Brazil's Oil Push May Spread Out

The Brazilian government's oil development monopoly may take a new tangent in its efforts to meet Brazil's oil needs. If current inter-governmental talks work out, it may invest in exploring for oil beyond Brazil's borders—in Bolivia (PW—Dec.7'56, p30).

This twist would be a novelty in South America, where other countries with government oil companies have taken steps to encourage foreign oil capital to come in and develop their oil resources.

Under an agreement signed in 1938, Bolivia granted Brazil the right to explore for and develop oil in certain sedimentary basins in Bolivia that border Brazil, in return for certain financial commitments.

Brazil has never exercised its rights to the acreage, inasmuch as it has had plenty of work to do—and little cash with which to do it—right at home.

But now the Bolivian government is reported pressing Brazil to develop the border area. Since its new petroleum code became law, private oil companies have already expressed interest in the acreage.

If Brazil activates the pact, Petroleo Brasileiro would undertake its first exploration outside of Brazil since it was founded in 1953. If production were established, the oil would probably be piped from Corumba to Santos, the Sao Paulo port.

But right now, Petrobras itself is looking abroad for foreign capital—to help finance its projected 90,000 b/d refinery at Rio.

This week is the deadline Petrobras set for bids to supply crude on a five- to ten-year basis. The terms: Loan required, in U.S. dollars.

Also, much of the financing for the plant itself is being arranged in France.

Universal Oil products did the preliminary process design for the refinery, which is scheduled to go on stream in September, 1959.

Five companies have been invited to submit bids on construction, with a Mar. 11, 1957, deadline. This was disclosed this week in Boston, at the annual meeting of the American Institute of Chemical Engineers, in a paper presented jointly by two Petrobras representatives, C. Campbell Williams and Antonio Saebra Moggi.

The companies are Foster Wheeler, Lummus, Parsons, Kellogg, and Braun. Final decision on the nature of the units to be built will be based on the offers Petrobras gets this week on the prospective crude supply.

Construction of the Rio refinery is part of Petrobras' plans to triple Brazil's present refinery capacity to 303,000 b/d by 1960—sufficient to refine all of its product needs.

At present, eight refineries—two of them owned by Petrobras—have a total capacity of about 123,000 b/d. These refine about 55% of Brazil's product demand.

Petrobras is already well under way on expansion of its two present refineries.

Its 7,000 b/d Mataripe plant, in Bahia, is now being expanded by Kellogg to 37,000 b/d (PW—May4'56, p35). Among units being added are an Orthoflow cat cracker, a 3,000 b/d lube plant (Brazil's first), and one of the world's largest wax plants.

Early next year, an ethylene recovery unit, now being fabricated in Europe, will be installed at its 65,000 b/d Cubatao plant, near Sao Paulo.

Within the next five years, a further 90,000 b/d of new refinery capacity will be built in three different areas: about 30,000 b/d in the southern state of Rio Grande do Sul; a new plant in the Sao Paulo area; the third in the north, at Belem.

Under Brazil's present law, six refineries owned by private Brazilian firms may not be expanded. But it is now thought that this law may be modified to permit expansion of "well run" plants.

The newest of these privately-owned plants is a 5,000 b/d refinery completed this year at Manaus. It is to operate on Peruvian crude produced east of the Andes by Ganso Azul, until such time as Petrobras establishes production in the Amazon Basin. Last summer, however, the plant was specially authorized to buy Venezuelan crude when the available Peruvian supply was insufficient.

The Manguinhos plant, at Rio, has a capacity of 10,000 b/d. Sao Paulo has two plants: the Capuava refinery, which now has been modified to handle 30,000 b/d; and the 1,000 b/d Matarazzo plant. There are two units in Rio Grande do Sul—the 6,000 b/d

Ipiranga plant and 300 b/d at Uruguaiana.

The Petrobras monopoly does not cover Brazil's now-budding petrochemical industry, but there is some pressure within the country to extend its monopoly to this segment of the industry.

A government commission appointed by President Jucelino Kubitschek is now studying the question. The president himself is known to favor leaving petrochemical development to private enterprise.

Hanging on the results of this study at present is a plan for production of synthetic rubber. By 1960, Brazil will need 30,000 to 40,000 tons of the synthetic product a year, because rubber needs are out-stripping Amazon output of natural rubber.

A butadiene plant and a synthetic rubber plant are to be built next to the new Rio refinery, but who will build them has not yet been settled.

Under present plans, Petrobras for the most part will sell chemical raw materials from its new installations for processing by private companies.

Early next year, an ammonia plant with 100 tons daily production capacity will go on stream at Cubatao to process refinery gas by the Texaco partial oxidation and Casale conversion processes. This output will permit production of 340 tons of fertilizer daily, or—by an alternate operation—310 tons of fertilizer and 40 tons of ammonium nitrate.

In the process, 1-million cu. ft. daily of hydrogen can be produced. This may be returned to the refinery to upgrade distillate fractions, or it may be sold for processing into methanol and formaldehyde.

The new ethylene recovery unit to be installed at Cubatao is being designed for a capacity of 60 tons daily, to allow for future production of ethylene by ethane pyrolysis. Initial operations, however, will be limited to 20 tons daily by the present supply of refinery gas.

The ethylene output will be used by several plants now being built around the Cubatao refinery: 5 tons daily will go to a Koppers styrene plant; 10-14 tons daily will go to a polyethylene plant being built by Union Carbide (another is to be built jointly by W. R. Grace and Farbwerke-Hoechst); and a small amount will be chlorinated by Electrochloro S.A., to make insecticides.

Petrobras will separate propylene and propane from refinery gas. The propane will be sold as LPG. Rhodia do Brasil will convert the propylene to isopropyl alcohol and ketones.

Liquid residuum products from Cubatao will be processed by two companies that will produce 20,000 tons a year of carbon black. One is Copebras (Celanese Corp. and Columbian Carbon Co.); the other is Organoquimica Brasileira.

Concurrently with its refinery expansion, Petrobras is making a big push to increase its crude production, which now meets only about 10% of current 200,000 b/d demand. This year, Brazil's oil consumption is valued at $318-million, of which imports account for $267-million—a severe drain on its foreign exchange reserves.

Present production, confined to the Bahia fields, has been stepped up from 7,000 b/d to 21,000 b/d this year, and output is expected to double that figure in 1957.

Drilling plans for the next four years call for an average of a well a day (PW—Aug.31'56,p34). The accompanying map shows locations of current operations, including Bahia development wells, wildcatting areas, and recent dry holes. The Nova Olinda well in the Amazon is noncommercial, but is now producing about 10-20 b/d. Two new wildcats are being drilled nearby.

Some 45 foreign technicians have thus far been hired by Petrobras, whose exploration chief is Walter Link, formerly Jersey Standard's chief geologist (PW—Oct.14'55,p28). Petrobras also has contract crews from several U.S. firms, which now have about 50 drillers and 75 seismic men at work in Brazil.

Petrobras is not overlooking the possibilities of shale oil either, which —in the context of Brazil's soft-currency economy—appears "economically interesting" on the basis of present data.

A modern shale oil pilot plant has been built at Tremembe, in the state of Sao Paulo. Studies on the high-moisture shales of the Pareibe valley are said to have been successful, and an economic evaluation of the data is now being completed by an American consulting firm.

The reserves in this valley are estimated at 2-billion to 3-billion bbl. Work is now also being started on the shales of the Irati valley, where reserves are even larger.

To cover its over-all expansion targets for 1960, Petrobras expects to increase its capital assets to 35-billion Cruzeiros ($1.9-billion at the official rate).

Its plans include doubling its tanker fleet to 400,000 tons; creation of an autonomous Brazilian Petroleum Institute, which would be partly supported by Petrobras; and increased training facilities. A special graduate school has already been formed for prospective petroleum refinery engineers—who are badly needed in Brazil. Next year a similar course of study in geology will be started at Bahia.

Oil Projects Spurred in Syria

BEIRUT—Despite Syria's considerable internal insecurity, Syrian-American drilling contractor J. W. Menhall is going ahead with plans to drill five new wildcats in the area of his recent Caratchok Dagh oil strike, near the Turkish and Iraqi borders (PW—Oct.12'56,p32).

The first of the new wildcats has already been spudded in on Menhall's concession in northeast Syria, at a site about 1 mi. from the discovery well. The latter is now reported producing from 1,500 b/d to 2,000 b/d, but it has been impossible to get direct confirmation of this from Syria. A real war psychosis hovering over the country has virtually cut it off from the outside world.

Menhall incorporated a new firm, Syrian-Arab Oil Co., in Delaware last May. Shares were on sale at Arab banks in the Middle East until last month.

Up to this point, he had been operating in Syria under a Syrian-registered firm, Menhall Prospecting & Exploitation Co. Last month he published a statement in Syrian papers that the company's prospecting work had been "crowned with success, and showed the existence of petroleum in Syria."

He therefore announced that prospective shareholders who had deposited sums in banks under this company's name as a deposit until oil was found would have ten days either to withdraw their deposits or to become shareholders in the new Syrian-Arab Oil Co. The latter apparently is to be registered as a development company.

Now Deutsche Erdoel, the German independent which recently acquired the only other present concessions in Syria, has announced that it will start exploration shortly.

The announcement in Hamburg last week followed on the heels of an earlier report from the Middle East that Concordia, the affiliate that holds the exploration permits for 5,790 sq.

mi., had requested authorization from the Ministry of Public Works to postpone exploration work temporarily. The company requested that the period of delay should not be figured into the time limit specified for initiation of exploration under the concession agreement.

Against a background of acute fuel shortage in Syria, Menhall has proposed importing a complete 5,000 b/d refinery from the U. S., to be set up in the Caratchok area to refine crude production.

In his proposal to Syria's Minister of Economy, Menhall said the plant would cost only $400,000, and that it would take four months to set it up and start operations.

The refined products would be used locally, and would help relieve the shortage which followed Syrian destruction of three Iraq Petroleum Co. pumping stations on the Kirkuk-to-Mediterranean pipeline.

Syria has no refinery of its own yet. Until the current disruption, Syria was supplied with products from IPC's Tripoli refinery, in Lebanon.

So acute is the shortage, in fact, that Syria asked the Lebanese government to refine for it some 180,000 tons of IPC crude which Syria confiscated at Banias at the start of the Suez hostilities. Lebanon—which also had requisitioned for its own use 100,000 tons of IPC crude at Tripoli—agreed to negotiate with IPC to refine the oil, but only on condition that Lebanon gets a share of the products.

Lebanon's Ministry of Economy said that if IPC agrees to refine the requisitioned crude, the products would be distributed as before, to the marketing companies in Lebanon and Syria. The distributors would pay IPC for the products the same price as in the past, the Ministry's communique said.

Current press reports in the Middle East say that, for political reasons, the Syrian government has finally decided to let the Czechs build the government refinery at Homs, despite technical disadvantages.

Earlier this year, several international bids to build the plant had been narrowed down to two: one from Britain and one from Czechoslovakia. The Czech bid was found wanting in a major component of the required equipment by the Syrian government's Egyptian adviser. For months since then, the Syrian cabinet has been split on the question of awarding the contract.

Pressed by its own oil shortage, Syria has at last entered into negotiations with Iraq about a partial resumption of the oil flow through the pipelines from Kirkuk to the Mediterranean.

The talks do not cover repair of the three IPC pumping stations destroyed within Syria.

The two governments are reportedly discussing minor repairs on the pipelines, which would permit IPC to pump up to 40% of its Kirkuk oil to Banias, direct from pumping station T-1 just inside Iraq. Iraqi sources believe that up to 9-million tons could be pumped to the Mediterranean this way while the Syrian pumping stations are being repaired.

Syria's conditions for entering into the talks is that no oil should go to Britain or France. But apparently the Syrian government has backed down on its ban against the rest of Western Europe.

It is still far from clear what Syria intends to do about repairing the IPC pumping stations, around which a military buildup is reported by some Middle East sources.

According to a fairly reliable Syrian Army source, Soviet military technicians have set up a base for Migs and Ilyushins between sabotaged pump stations T-3 and T-4. Up until mid-November, according to this source, there were 25 Mig-17s and 25 Ilyushin-28 jet bombers at this base.

According to other information, Soviet ships at Latakia harbor have been offloading spare parts for the planes, and probably more Migs that would be assembled later in Syria by Soviet technicians.

Travelers from Syria arriving in Beirut last week said that military equipment is being moved from Latakia eastward to the desert along IPC's now-idle pipelines, under the cover of night, a blackout, and a curfew.

What's New / AROUND THE WORLD

Zimeri Bid Falls Through

JORDAN—Guatemalan millionnaire Jorge Zimeri's bid for an oil concession has been axed by the new anti-Western government.

Ministry of Economy officials said the government has informed Zimeri it has cancelled the projected exploration agreement, under which he would have acquired half of the two-third of Jordan remaining outside the Edwin W. Pauley Co. concession.

The draft concession—similar to Pauley's—was ready for approval when parliamentary elections on Oct. 21 seated a government that includes Socialists and one Communist. At the time, Zimeri was fairly confident that the agreement would be signed by the new government and ratified by the new Parliament (PW—Nov.9'56, p30).

Oil men in Jordan are at a loss to explain the sudden decision on the Zimeri bid—which, in fact, has been submitted at government invitation.

One reason may be the anxieties of the present situation in the Middle East, particularly on Jordan's borders with Israel.

Another may be the pinkish hue of the present Parliament. It includes 4 Communists and 18 Socialists and sympathizers, out of 40 deputies—of whom at least 29 are anti-Western anyway.

Zimeri himself is very outspoken, a man who has often expressed publicly that he has no love for extremism, or planned economy, or any form of restriction on private enterprise. This, of course, cannot sit well with the present leaders in Jordan.

Another guess is that the Jordanians cancelled the draft agreement because Zimeri turned down the government's request that he buy a large share in the projected government refinery at Al-Karkaa. Zimeri told them he would be interested in a controlling 51% share or nothing at all. The Jordanians had been having difficulty in getting public subscriptions for the refinery from neighboring Arab countries.

•

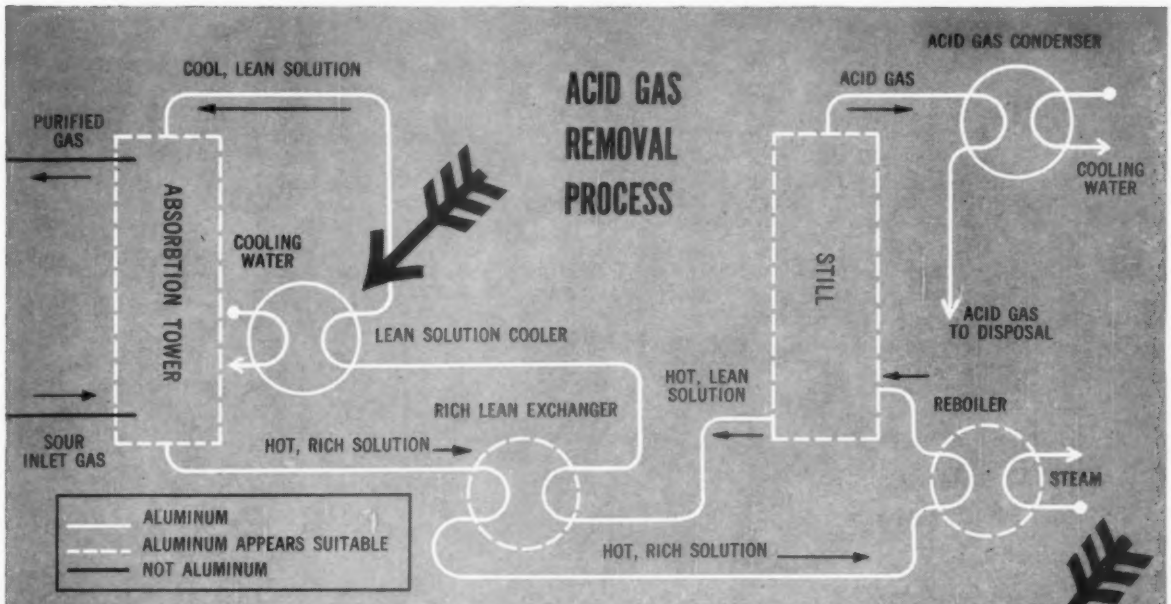
Back to Work

LEBANON—Robert H. Ray's geophysical crews are going back to work all over the Middle East, as tensions ease in the area.

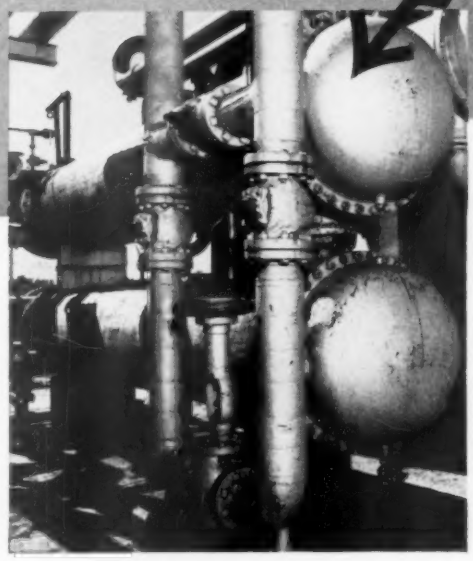
"Our boys have been having a little recess in Beirut and Rome. Now they're all going back to work," said Ray, who was in Beirut to look over operations of his crews in nearly every Middle East country.

He was referring specifically to the Ray gravity and seismic crews in Jordan and Egypt. The Jordan group, which is under contract to Edwin W. Pauley Co., had been evacuated to Beirut (PW—Nov.16'56,p56). The

Major oil company proves corrosion resistance of **ALCOA ALUMINUM** Heat Exchanger Tubes



Flow chart shows typical acid gas removal with uses of aluminum indicated. ALCOA Aluminum alloys provide outstanding resistance to H_2S and CO_2, contaminants commonly encountered in the petroleum industry. Both aqueous amine and glycol-amine solution systems employ aluminum in heat exchanger tubes, tower internals, etc. . . . for improved service life over alternate materials . . . at far lower cost. (Photograph at right shows lean MEA solution cooler referred to below.)



Over 750 days' exposure to corrosive gas contaminants has proved to a major oil company the superior resistance of ALCOA Alclad Heat Exchanger Tubes. Used in the lean MEA solution cooler of a Girbotol Gas Treater, the tubes are exposed to a solution carrying 10 grains of hydrogen sulfide per gallon at the rate of 350 gallons per minute. After more than two years of service, the aluminum tubes are virtually unaffected.

Such service records have proved time and again that ALCOA Alclad Aluminum Tubes withstand corrosion best. Materials like hydrogen sulfide and carbon dioxide—normally corrosive to most metals—are not corrosive to aluminum. That means longer service life, less maintenance—to reduce process operating costs.

What's more, ALCOA Aluminum Heat Exchanger Tubes in the common sizes cost far less than seamless tubes of other common materials . . . one-half as much as Admiralty brass . . . one-third to one-fifth as much as cupronickel or stainless steel. It will pay *you* to use the handy coupon today for complete details.

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Alexandria group, working for Sahara Petroleum Co., had been evacuated to Naples, then to Rome, by the U. S. Sixth Fleet.

Ten members of Ray's Jordan group —all Americans—have returned to Amman to continue their seismic work for Pauley. The remaining 12 evacuees from Jordan—gravity crews that include Americans, Britons, Canadians, and Italians—are now being deployed to Libya and Turkey, where Robert H. Ray is on contract to Socony.

Ray said he hoped his crews would be back in Egypt shortly also. Sahara Petroleum, which had been doing extensive exploration and drilling in Egypt's Western Desert, is planning to return to that area as soon as possible.

Ray said his crews have been carrying on as usual in Iraq for Iraq Petroleum Co., and in Saudi Arabia for Aramco.

•

Oil Use Will Soar

JAPAN—Industrial demand for fuel oil will climb a whopping 148% in the next 20 years, by which time oil will replace coal as a major source of energy, according to a new forecast by the Ministry of International Trade & Industry. In the same period gasoline demand will soar by more than 300%.

Demand for fuel oil will increase from 36.6-million bbl. in fiscal 1956, to 90.7-million bbl. in 1976. Gasoline demand will leap from 16.6-million bbl. to 66.7-million bbl. in the same period.

MITI estimates that domestic demand for coal would have jumped to 110-million tons by 1956 if enough coal had been available. Output this year will total about 49-million tons. But production cannot be increased beyond the 65-million-ton mark, so industry will have to shift to oil.

Demand for electric power will nearly triple, from the present 50.4-million kwh. to 147.5-million kwh. in 1976.

•

ISRAEL—Cuts in foreign crude supplies plus reduced drilling by foreign oil companies are forcing Israel to step up its own production and drilling at Heletz, the country's only producing field (PW—Oct.19 '56,p44).

Plans call for increasing output from the present 950 b/d to more than 2,100 b/d by the end of February. Beginning in January, up to 12 rigs will be drilling in the Heletz area. Three other producers will be completed as soon as casing and tubing is available. Another seven tests are being drilled.

Heletz oil began moving to the Haifa refinery late last month, for the first time. The oil was moved by tank car, but plans for a pipeline are under way.

Most of the production increase will result from using larger chokes. The discovery well, No. 1 Heletz, was producing 125 b/d through 3/16-in. choke. With choke increased to ¼-in., the yield was 205 b/d, with drop in top pressure from 119 psi. to 111 psi. Another test on No. 5 Heletz produced similar results, leading to the decision to increase size of chokes on all producers.

The biggest cut in crude supplies came when Russia canceled its contract to supply Israel with 20% of her crude needs.

•

SOUTH AMERICA—The increasing exploratory activity in South America is underlined by announcement of two new contracts recently awarded to Seismograph Service Corp., of Tulsa.

Under the new contracts, SSC will move its fourth crew into Brazil, and its fifth seismic crew into Venezuela.

These make SSC the largest seismic contractor in South America, according to president Gerald H. Westby. A total of 11 SSC seismic crews and two velocity logging units are working on seismic exploration in some of the wildest terrain in the Western Hemisphere, he says.

•

IRAQ—The government's fourth-quarter oil revenues will dive to little more than $25.2-million. This is less than half the $58.8-million anticipated before the flow of oil from the northern fields was halted on Nov. 2 by sabotage of Iraq Petroleum Co.'s pumping stations in Syria. Suspension of the oil flow is costing Iraq an estimated loss of $560,000 daily.

Under its 50-50 profit-sharing agreement with the IPC group of companies, the government received $164,847,572 in oil revenues for the first nine months of 1956. Revenues for all of 1955 totaled about $207.2-million.

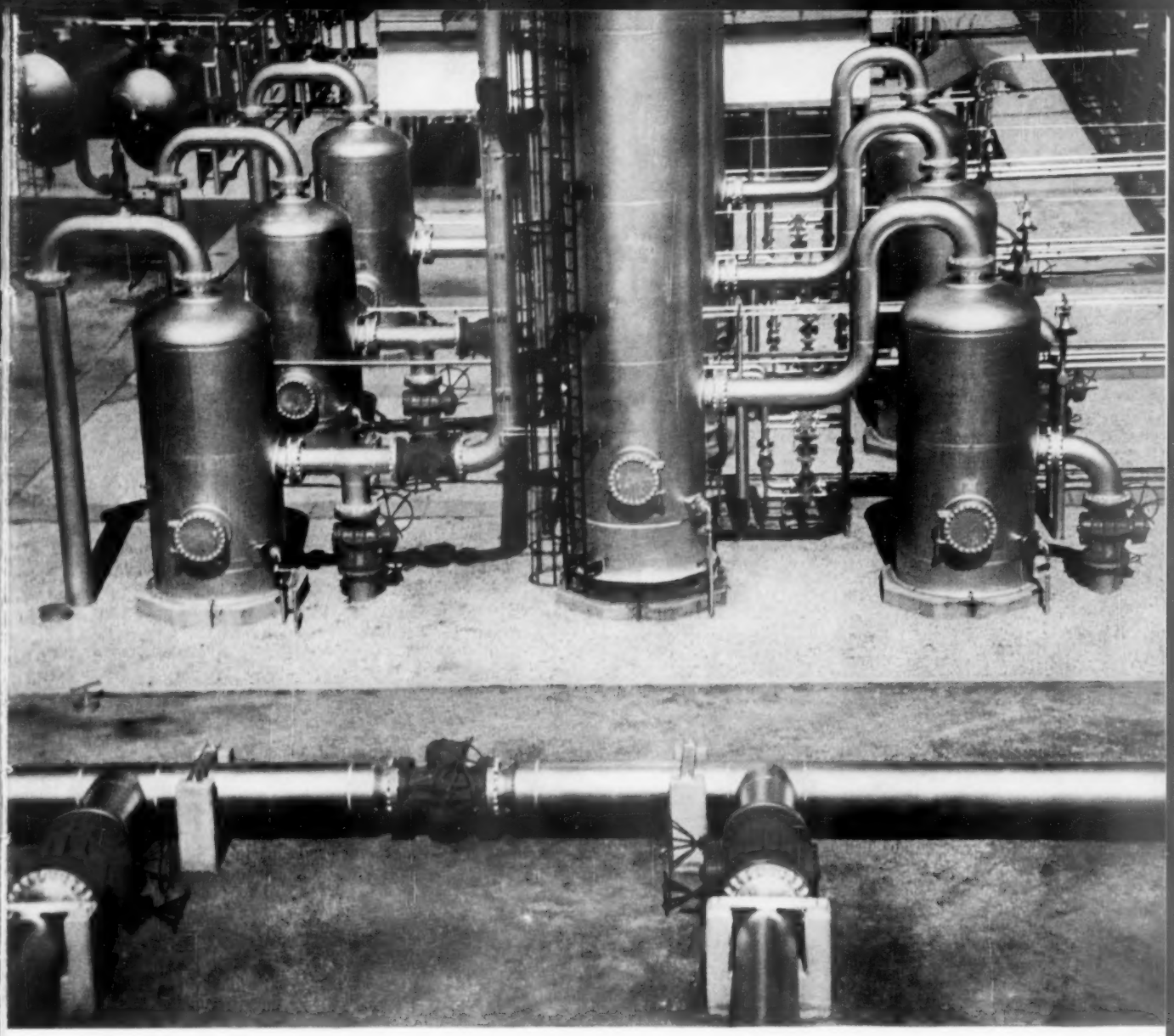
•

LEBANON—Tapline's deliveries of Saudi Arabian crude to Sidon dropped to 315,085 b/d in November, the low point for the year. The high was 351,856 b/d in August.

The average for the first 11 months of 1956 remains above last year's 321,040 b/d, at 329,215 b/d.

Mobile Exploration Unit Heads for Venezuela

A General Geophysical Co. mobile division has left Houston for Venezuela, where it will undertake oil reconnaissance operations for Superior Oil Co. This initial assignment results from GSC expansion program, under which it offers complete prospecting services in any overseas area. The operation for Superior Oil will be directed by seven specialists from GSC's Houston headquarters, who will head a staff of about 50. Equipment already shipped includes a recording truck, a shooting truck, two drill trucks, four water trucks, one oilfield body truck, and tons of drill pipe, spare parts, and maintenance equipment. The big packaging job was handled by Exploration Equipment Co.



How much does safety cost?

You don't pay extra for the inherent safety of Rockwell-Nordstrom valves. Actually, their price is often lower than ordinary valves. Their cost to use, year after year, is much lower because lubricant stops trouble before it starts.

Forty years of outstanding performance have proven you can't buy a safer valve than Rockwell-Nordstrom. Pressurized lubricant sealing means positive, leakproof control on lightest gases. Streamlined thru-port design minimizes pressure loss on even heavy slurries. Quarter-turn operation is two to five times faster than ordinary valves. You *know* you are safe when you specify Rockwell-Nordstrom valves. Rockwell Manufacturing Company, Pittsburgh 8, Pennsylvania.

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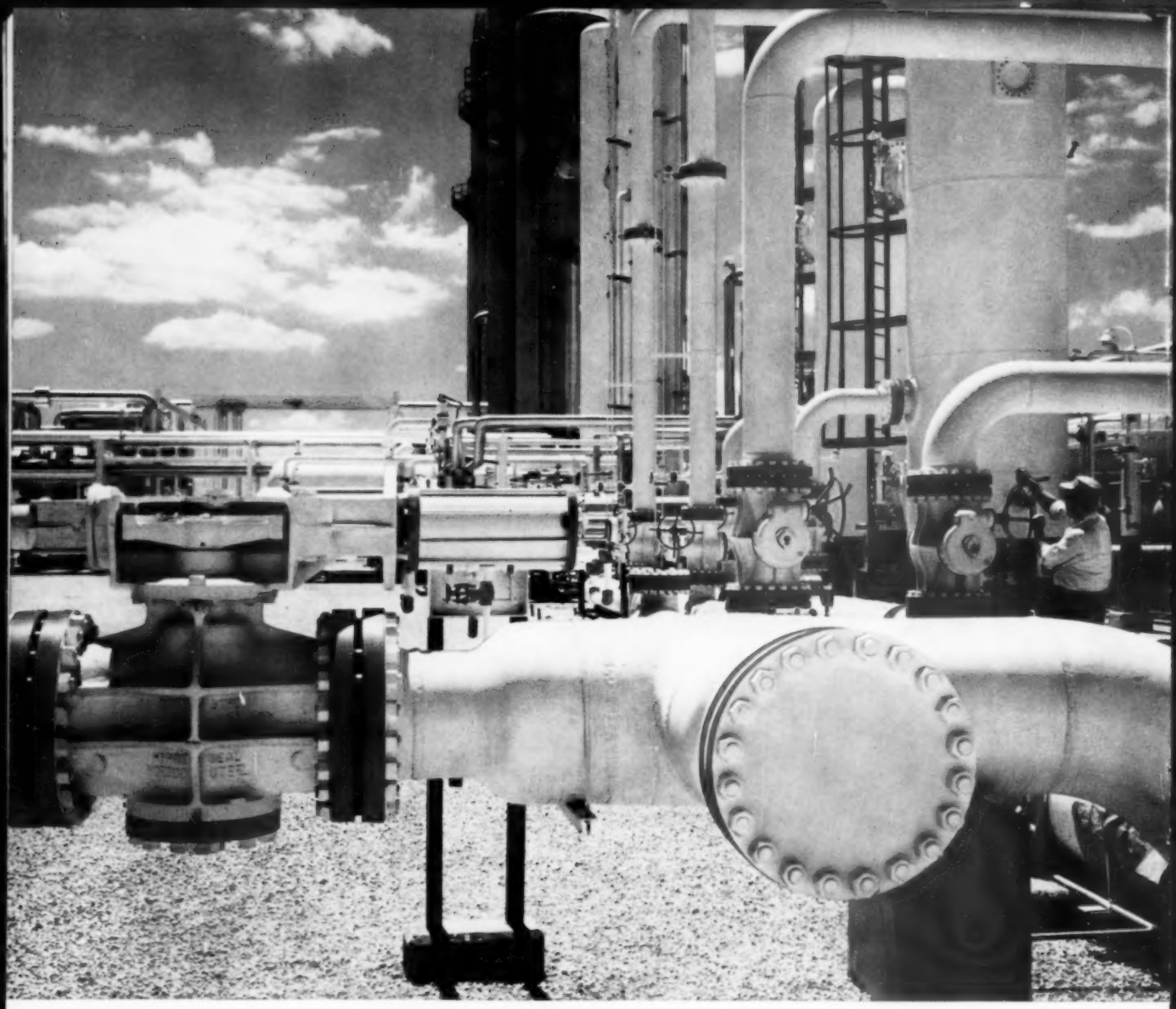

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Rockwell-Nordstrom valves' quarter-turn operation allows the use of less complicated (and less costly) operators. Lubrication greatly reduces torque. The thin, tough film of *pressurized* lubricant that forms the leakproof seal also cuts maintenance and down time by stopping trouble before it starts.

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Available at leading suppliers . . . everywhere.

ROCKWELL-Nordstrom VALVES

Lubricant Sealed for Positive Shut-off

40th Year *of lubricated plug valve leadership*

SALVAGE CREWS already are hard at work in the Port Said area as United Nations forces take steps to see that . . .

Suez Canal Reopening is Speeded

To obtain a direct, on-the-scene report about conditions along the Suez Canal, William J. Coughlin, PETROLEUM WEEK*'s London Bureau Chief, flew to the canal last week. He spent several days talking with military and United Nations officials, inspected the canal itself to a point well within the Egyptian lines. Here is his story, filed from Rome to avoid censorship difficulties.*

The Suez Canal may be cleared of obstacles and reopened to traffic in much less than the six months originally anticipated.

Just how fast the task can be completed depends in part on how quickly salvage crews can move into the canal and begin operations. But it also depends on the number of obstacles that lie beneath the surface of the canal.

The Egyptians report that they tumbled several objects into the canal in addition to the ones showing above water. Until it is definitely known what these objects are and where they are, any firm time schedule for clearing the waterway cannot be set up.

In the face of this situation, a United Nations spokesman maintains that "there are indications that clearing the canal may not take so long as originally thought."

And Suez Canal Co. officials are talking in terms of weeks rather than months in calculating the time required to reopen the canal.

Hope is to get a passage suitable for ships of 25-ft. draft cleared as rapidly as possible. Such ships account for 70% of traffic in normal times.

With such a channel, even tankers of greater draft could pass through the canal by loading to something less than capacity. Possibly, additional crude then could be picked up at Sidon, Lebanon, Mediterranean terminus of Tapline.

A United Nations technical committee was due to start surveying damage to the canal this week.

Somewhere between 47 and 51 obstructions (the Egyptians and British figures, respectively) must be removed from the entire canal—in addition to any presently unknown underwater objects.

One of the biggest obstacles to speedy clearing of the canal was removed when Egypt agreed to let the United Nations assist in the salvage task.

The United Nations Technical Force that will clear the canal will operate entirely separately from the United Nations Emergency Force, which is the "police" force that began moving in shortly after the cease-fire.

A substantial salvage fleet already is assembled at Port Said, and more equipment is on the way.

This is an Anglo-French force of about 46 pieces of equipment. It includes eight ships, all en route, chartered from commercial firms. And despite Egyptian distaste for anything that is Anglo-French, it seems highly likely that the United Nations Technical Force will find some means of using these salvage ships.

This fleet already has made big strides in clearing the Port Said harbor. A channel has been opened that is believed sufficient to clear 13 merchant ships, as soon as Egypt gives them permission to leave.

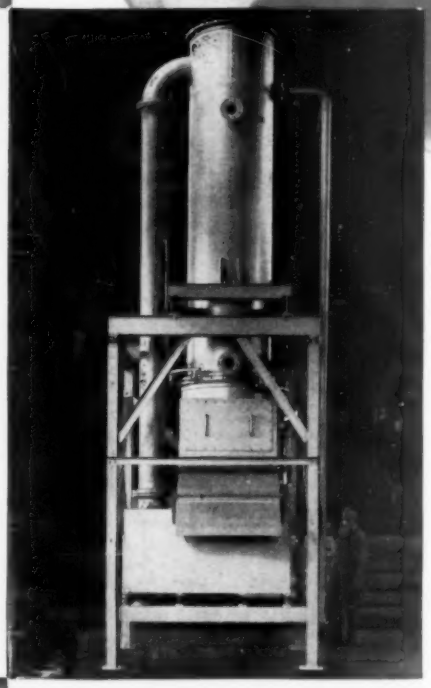
This may help the only U.S. tanker trapped in the canal. It is the 38,000-

DIVER prepares to inspect underwater damage to vessel.

*this machine congeals, molds and discharges automatically

"What is your processing problem?"

*If your process involves a liquid that will solidify when cooled.... ....this machine can do it....then discharge and size the substance.... all automatically



If you have a processing problem, perhaps the Vogt Automatic Tube-Type Molding Machine will provide the answer because it will form and size any liquid that will solidify when cooled, and will discharge by gravity upon heating.

Now in use by major chemical companies, these units have achieved tremendous savings in labor while producing a more uniform product. Also, since the process involves "freezing" or solidifying the substance while it circulates through tubes, the quality of the product is often superior to that of the original charge.

The wide range of uses to which Vogt Tube-Type Molding Machines have been adapted indicates their definite value in the chemical processing field. Adaptation possibilities are virtually unlimited and you may request detailed technical information from our engineers without obligation.

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ton "Statue of Liberty," of the Cities Service tanker fleet. Traveling under ballast from Philadelphia to Kuwait, it was trapped north of the destroyed El Ferdan railroad bridge.

Capt. A. H. M. Derkx believes he can dump water ballast to lighten the ship, turn it around at the south fork El Ballah bypass in the canal, and head back to Port Said. All that is needed is Egyptian permission.

The big question mark at the moment is the condition of the southern portion of the canal, held by the Egyptians. This comprises about 75% of the canal's length. But it is believed that obstructions in this section are fewer and will be less troublesome than those in the northern section.

What's New
IN TRANSPORTATION

A new way of figuring rates for ocean tankers may replace the old, barnacle-encrusted "USMC" method. Up to now, tanker rates have been figured in terms plus or minus the last schedule published by the U.S. Maritime Administration—a schedule that expired in June, 1948.

An up-to-date schedule, called American Tanker Rate, has been published by the Assn. of Ship Brokers & Agents, of New York. Industry sources say it has a "good chance" of being accepted.

•

The new U.S. Nationalist China shipbuilding firm formed on Formosa will begin operations by building two 32,000-ton tankers for use by Gulf Oil Co. Ingalls-Taiwan Shipbuilding & Drydock Co. (PW—Nov.23'56, p27) has promised delivery of its first vessels in 1958. The vessels will be owned by United Tankers Corp.

•

Mississippi River barging again is hit hard by low water conditions, after brief help from November rains (PW—Nov.9'56,p29). Conditions are expected to get worse.

Clearance at the lower sill of the Alton (Ill.) locks was 6.9 ft. last week.

•

Ten more giant tankers may soon be ordered in U.S. yards. The Maritime Administration has O.K.'d the following proposals:

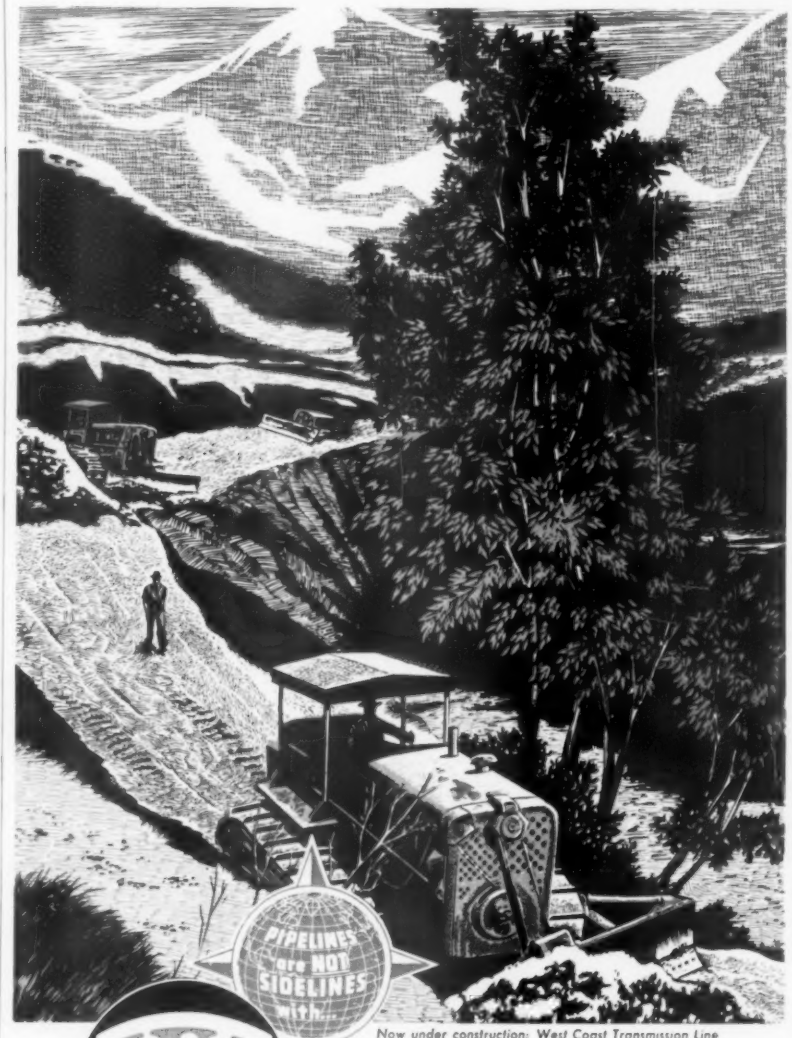
Astral Compania Naviera, S.A., wants to build two 65,000-tonners, for Liberian registry; Flanigan-Loveland Shipping Co., S.A., want to build six 46,000-tonners, also for Liberian registry; National Shipping & Trading Corp. plans to build one 60,000-tonner, after transferring three T-2s to foreign registry; and Ocean Shipping & Trading Co. would build one 46,000-tonner, in return for a trade-out of three victories.

•

A 394-mi. LPG pipeline from Moundsville, W. Va., to Marcus Hook, Pa., is being planned by Underground Storage & Exploration, Inc., of Upper Darby, Pa. The firm has asked for government aid in construction of the line.

•

Cities Service Gas Co. plans to build about 60 mi. of natural gas gathering lines in Oklahoma. The company was granted temporary authority by the Federal Power Commission to build and operate the lines, which will be in Grant and Alfalfa Counties. Estimated cost is $1,288,600.



Now under construction: West Coast Transmission Line

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...EVEN WITHOUT STANDBY... WITH RCA MICROWAVE

IN VITAL 2-SYSTEM OPERATION AT EL PASO NATURAL GAS CO.

The dependability and flexibility of RCA CW-20 Microwave equipment have been demonstrated at El Paso Natural Gas Co. An original 290-mile pipeline installation in Texas, in 1953, has more recently been augmented by a newer 475-mile system in western Texas and New Mexico . . . achieved with a minimum of expense.

According to the Superintendent of Communications of El Paso Natural Gas Co., outage time has never been more than 1%—without standby and wholly without overtime maintenance. In addition, it has been possible to rearrange the systems to fit new requirements as they arise.

The original installation with short-haul leg circuits was used for voice channels and telemetering. Because of its reliability, additional channels were added, and RCA Equipment was chosen for the second installation.

Routes of El Paso Natural Gas Co.'s pipeline microwave systems in mountainous regions of Texas and New Mexico, and (below) microwave antennas on mountain.

RCA MICROWAVE assures the most advanced engineering features. Provision for the addition of future channels makes it the least expensive form of communication per channel mile. Equipment utilizes easy-to-service familiar circuits and conventional tubes. Single side-band suppressed carrier frequency division multiplexing is used exclusively to meet high standards of dependability. Frequency is controlled only from the terminals through the entire system. Furthermore, RCA provides the nation-wide services of the RCA Service Company to keep entire system operating at its peak.

RCA Microwave Specialists will be glad to answer any questions and help plan your installation. Mail coupon for further particulars on use of Microwave in utilities, pipelines, turnpike and other applications.

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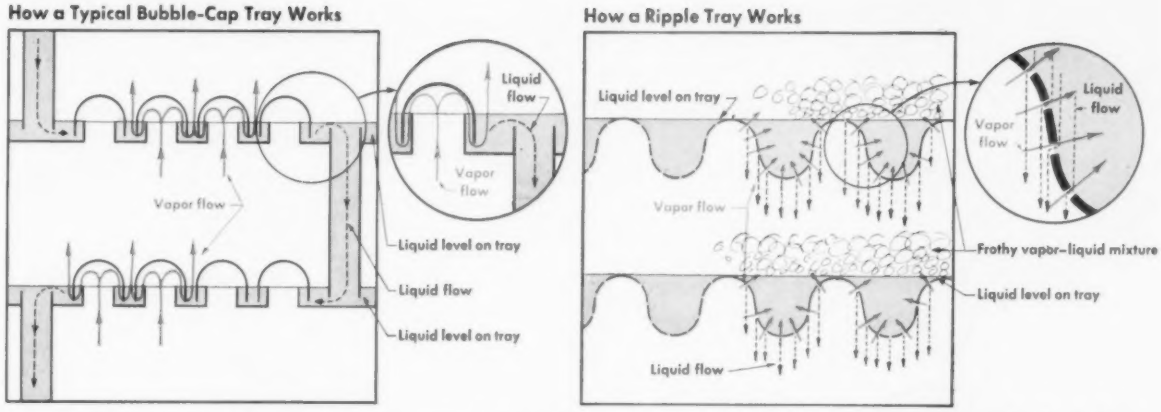


DESIGN of the new Ripple Tray (right) offers some advantages over the conventional bubble tray. Here are some details on the . . .

Ripple Tray: New Fractionation Tool

A new fractionating-tower tray—called a Ripple Tray—has been developed. It is said to increase distillation capacity without loss of fractionation efficiency.

The Ripple Tray was developed by Stone & Webster Engineering Corp. It was described in Boston this week at the annual meeting of the American Institute of Chemical Engineers by Dr. Margaret H. Hutchinson, of Stone & Webster, and Dr. R. F. Baddour, of the Massachusetts Institute of Technology.

As shown in the drawing (above, right) and in the picture (below, right), the new vapor-liquid contacting tool is formed by pressing sinusoidal waves into flat, perforated, light-gage sheet metal. Stainless steel is the most commonly-used metal, but almost any structural metal can be used.

No downcomers are required to conduct liquid down a fractionation column, such as those used with bubble-cap trays (drawing, left).

In the Ripple Tray design, the rising vapors pass through the perforations in the trays. The velocity of the vapors tend to keep the liquid mixture in a froth above the liquid level in the trays. The cooler liquid passes downward in the column through the same perforations.

In one application of the new tray in a crude distillation unit, a boost in capacity to about 150% of original design throughput was reported.

Ripple Trays were installed in a crude unit with an original design capacity of 20,000 b/d, using bubble-cap trays. Previous attempts to boost capacity above 20,000 b/d had resulted in loss of fractionation efficiency according to Hutchinson and Baddour.

With the use of Ripple Trays installed in the same tower shells, and in all locations affected by loading, capacity was boosted to 31,500 b/d.

Ripple Trays are now in operation—or planned—for a variety of commercial applications in addition to atmospheric and vacuum crude distillation.

The applications include naphthalene and phenol purification, propylene and isopentane recovery, gasoline stabilization and rerunning, styrene rerunning, ethylene-ethane fractionation, tar separation, depropanizing, and demethanizing.

Advantages claimed for Ripple Trays are high capacity, tray efficiency that is insensitive to load changes, and low cost due to simple construction. The advantages claimed have been proved in both semiworks and commercial installations, according to Hutchinson and Baddour.

The major reason for the high capacity and efficiency under variable load factors is attributed to the sine-wave design of the tray.

The advantages of such a design are:

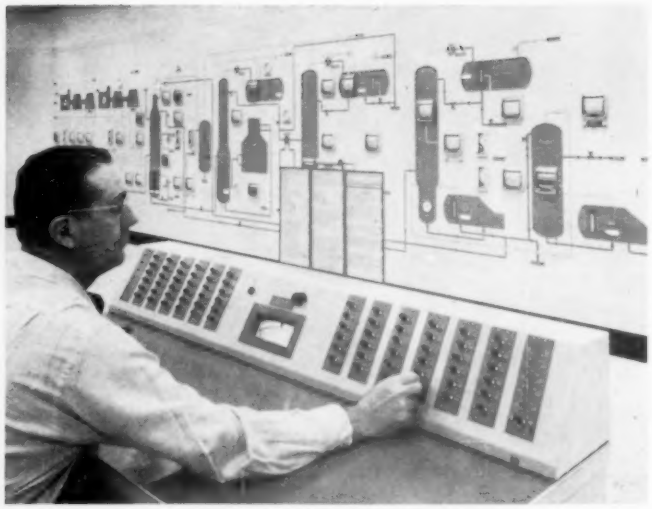
- It helps to distribute liquid as it flows down a tower from the bottom of one tray to the froth above the next tray.
- It acts as a predetermined discharge point for the liquid, providing flexibility with respect to vapor and liquid loads on any given tray.
- It supplies a third dimensional design variable by which the desired load ranges can be accommodated.

The depth of the sine wave used varies, depending upon design liquid loading. Shallowest wave depths are used for low loadings—under 500 gal. an hour per square foot. Deepest waves are for high loading.

In the usual construction, Ripple Trays consist of sections framed by vertical rims, and are narrow enough to pass through 18-in. manholes. Sections are bolted together in the tower shell, and then the complete tray is clamped to a support ring.

When installed in towers up to 9 ft. in diameter, the trays do not require additional beams for support.

THE RIPPLE TRAY is manufactured in several standard types. Special modifications can be made.



TIDEWATER's 42,000 b/d fluid coker (unit, left; control panel, right) is set for start-up at its West Coast refinery as . . .

Tidewater Plans New Unit for Avon

Tidewater Oil Co., just starting up the world's largest fluid coker at its Avon (Calif.) refinery, is planning for additional construction at the plant.

The new fluid coker, a 42,000 b/d unit (pictures) is a twin of a unit now under construction at Tidewater's 130,000 b/d refinery at Delaware City, Del.

Both units use the Esso Research & Engineering Co. fluid coking process. The Avon coker was built by Bechtel Corp. C. F. Braun is constructing the coker at Delaware City.

Tidewater plans to make optimum use of its coker because:

Tidewater now is completing plans to build a 22,500 b/d Houdriformer at Avon that will use pulverized coke from the new coker, as boiler fuel, a unique feature.

The new unit is scheduled to be started early next year with completion planned for January, 1958.

The boiler for the Houdry Process Corp. catalytic reformer will consume 175,000 tons of coke annually, or about half the coke output of the fluid coker.

And while the boiler initially will be used to supply 600 psi. steam for the reforming operation, it will be designed to generate steam eventually at 1,300 psi. to operate an electric power generator to supply the refinery's power requirements.

When the boiler is operating to supply steam for the generator, it will use up the coker's entire output of fluid coke.

So far, no use has been found for fluid coke other than as boiler fuel. But its use as an industrial fuel—particularly in California—may increase in the already-tight fuel oil market in the state.

The planned new reforming capacity at Avon, designed primarily for gasoline octane improvement, will also supply additional byproduct hydrogen—which, in turn, will permit charging greater volumes of sour crudes to the refinery.

Tidewater is planning its Avon refinery for a hydrogen balance. The company will hydrogen-treat its gasolines and distillates for quality improvement, and also the gas-oil from the coker if reduced sour crudes are eventually used in the coker.

A big reason for turning to hydrogen treating, instead of acid- or caustic-treating techniques, is the problem of disposing of the spent acid or caustic. These are difficult liquids to handle, and can create expensive disposal problems. On the other hand, Tidewater has a ready outlet for the hydrogen sulfide that results from hydrogen treating.

Hydrogen sulfide now goes to an adjoining chemical plant, jointly owned by Tidewater and Monsanto Chemical Co., where it's converted to sulfuric acid and ammonium sulfate.

Presently, the Avon refinery has a 10,000 b/d Universal Oil Products Platformer as its source of hydrogen.

But the hydrogen-consuming capacity totals 34,000 b/d, consisting of two UOP-licensed Unifining units.

Tidewater's reason for installing the fluid coker is because demand for gasoline and distillates continues to rise, while demand for heavy fuels is expected to be static over the long pull.

Initially, the 42,000 b/d unit will operate at about 26,000 b/d, according to Oscar Larson, refinery manager. But even at that rate, the coker will reduce the heavy fuel oil output of the refinery about 30%.

At full-capacity operation over a long period, Tidewater estimates that its output of heavy fuel at Avon will be trimmed by 25%, and its yield of gasoline will be increased by between 20% and 30%.

At full capacity, the Tidewater coker will increase California's coking capacity by 40%, to 103,000 b/d. The remaining coking capacity consists of Union Oil's 20,000 b/d at Santa Maria, General Petroleum's 37,000 b/d at Torrence, and Bankline Oil's 4,000 b/d at Bakersfield.

Charge stock to Tidewater's Avon coker will be primarily heavy asphaltic pitch, ranging down to about 5-gravity. It will come from the reduced crudes in the vacuum units. Besides these tower bottoms, feed will include surplus fuel oil and low-gravity, high-sulfur crudes.

Liquid yield of the coker will be about 20% debutanized gasoline and about 55% gas-oil of 1,015F end point. In addition, the coker will also produce dry gas, propane, butanes, and weight-yield of about 23% coke. Nearly 5% of the coke yielded will be burned as process fuel in the unit.

Tidewater estimates that net operating cost of the unit will be about 15¢ per bbl. of throughput when the unit is operating at full capacity.

What's New / IN REFINING

Ethyl Corp. is developing a new process for making tetraethyl lead—a process described as "radically different" from any heretofore used.

The chemistry of the process, according to Edward L. Shea, Ethyl president, involves a reaction between a metal alkyl and a lead compound.

He says that development work is still in its early stages. However, he says, the process shows "considerable promise because it eliminates certain intermediate materials and steps involved in the present manufacturing operation, and has proven superior to all processes now known."

The generally used process for making TEL is to react a sodium-lead alloy with ethyl chloride. One radically different technique—though controversial—has been developed by Germany's Karl Ziegler. It is a two-step process. The first makes triethyl aluminum from ethylene, hydrogen, and aluminum. The second is an electrolysis of the triethyl aluminum with lead anodes, to produce TEL and recover the aluminum, which is recycled.

Ethyl, so far, is not giving out any technical details of its new process.

•

Ethyl Corp. is laying off about 235 employees at its Baton Rouge and Houston tetraethyl lead plants.

The layoffs are attributed to a "lower-than-expected" demand for TEL and to a declining market for sodium by detergent manufacturers, according to G. O. Hayes, Houston plant manager.

•

Phillips Petroleum Co. and Pacific Petroleum, Ltd., will build a $30-million plant in British Columbia to process natural gas liquids.

Construction of the refinery, at Taylor Flats, will be started next spring. Capacity has not been fully determined. Each company will own a 50% interest in the plant.

Under an agreement between the companies, Pacific Petroleum will build a distillation unit, a catalytic desulfurization unit, a catalytic reformer, and part of the blending and storage facilities.

Phillips will build a dehydrogenation unit, a butane isomerization unit, an alkylation plant, and the remainder of the blending and storage facilities.

Raw natural gas liquids will be supplied from a natural gasoline plant being built by Westcoast Transmission Co.

•

The government acted last week to make certain that procurement contracts set aside for small refiners won't end up on the books of larger firms.

Small Business Administrator Wendell B. Barnes acted:

(1) To require nonmanufacturers holding set-aside contracts obtained from small refiners to certify that, in fulfillment of the contracts, they will supply materials produced by small refiners.

(2) To modify the definition of "small" and "large." Previously, all firms with 500 or fewer employees have been classified as "small" and, therefore, elegible for set-aside contracts. The new rule is that such firms will not be called "small" if they are a dominant firm in their industry.

•

Petroleum Chemicals, Inc., will build a petrochemical plant at Lake Charles, La., to produce 200-million lb. of ethylene annually.

The new plant, scheduled for completion in January, 1958, will be built adjacent to the company's butadiene plant. Raw material for the ethylene plant will come from the Cities Service and Continental Oil refineries at Lake Charles. (The two are joint owners of Petroleum Chemicals.)

Lummus Co. is the contractor.

•

Shell Chemical Corp. has completed two new epoxy resin units at its Houston plant, designed to triple the output of Shell's "Epon" resin.

One of the new units will produce liquid grades, and the other will produce solid grades of the resin.

•

Atlas Corp. will acquire a controlling stock interest in El Dorado Refining Co. The actual acquisition will be made by Petro-Atlas, a wholly owned Atlas subsidiary.

El Dorado has an 18,000 b/d refinery at El Dorado, Kan., a pipeline gathering system, and producing leases in Kansas.

A COMPLETE REFRACTORIES SERVICE...
for the Petroleum Industry

LITECAST 50—
A hydraulic-setting insulating castable refractory material, having a density of approximately 50 lbs. per cubic foot. Its extreme light weight and exceptionally low thermal conductivity make it an efficient and economical heat insulator. Recommended for vessel linings and backing for brickwork for other heavier castable refractory materials.

HIGH-STRENGTH BRIK-CAST—
A hydraulic-setting castable refractory material unique in that it contains more bonding agent, which results in a product more resistant to the physical actions of impact, erosion, and load bearing. Used extensively for lining regenerator chambers and catalyst lines in catalytic cracking units.

LITE-CAST 50-M—
A 50-pound density insulating castable, having a high degree of purity, used as a liner in vessels and lines where atmospheres must be controlled, or contamination of internals must be avoided. LITECAST 50-M may be applied in the same manner as standard hydraulic-setting castables.

BRIK-CAST 3000—
A hydraulic-setting castable refractory material, composed of clays and bonding agents having the highest purity, resulting in a product with a high operating temperature (3000° F.), and resistance to reducing atmosphere in carbon monoxide attack. Recommended for sulphur burner chambers and other vessels operating above normal cracking and reforming temperatures.

GENERAL REFRACTORIES CO.
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GENERAL REFRACTORIES

DEPT/Marketing

Gasoline Fair Trade Down—and Out?

- **Serious legal troubles have beset resale price maintenance on gasoline. If the system breaks down, more price wars may be just around the corner.**
- **The wars would mean one thing: added dealer support for marketing-control bills in the new Congress.**

The oil industry is bracing itself this week for the possibility of new, widespread gasoline price wars. The reason: Gasoline fair trading—one of the most effective anti-price-war weapons suppliers have come up with—appears to be ready to collapse.

Storm warnings have been flying over fair trade areas for a couple of months (PW—Oct.26'56,p38). Since early fall, price cutting in East Boston has had marketers fearful that fair trade was breaking down.

Out of this same price cutting has come the legal thunderbolt that could change the whole gasoline fair trade picture.

A Boston court decision may have set in motion the divorce of fair trade from gasoline retailing. The ruling: A supplier cannot "compete" with its service stations and still maintain fair trade agreements with them. This includes "competition" for commercial accounts (PW—Nov.30'56,p10).

The ruling is the first application of the Supreme Court decision in the McKesson & Robbins case to oil marketing. If it is upheld, it could set a precedent for similar rulings in other states where fair trade is being used to put a floor under gasoline retail prices (Connecticut, Rhode Island, New Jersey, and Pennsylvania).

The supplier-defendant in the case, Esso Standard Oil Co., is asking for a reversal of the ruling. But Esso would probably settle for permission to amend its fair trade agreements to exclude station sales to commercial accounts from fair trade enforcement.

Judge Charles E. Wyzanski handed down the ruling in response to Esso's request for a permanent injunction against one of its dealers who had been selling below fair trade minimums. The dealer, Secatore's, Inc., asked denial of the injunction because Esso was "in competition with him for commercial account business."

Now, Esso has filed a brief with the Circuit Court of Appeals in Boston to reverse the lower court's decision. A reply brief from Secatore's is expected by the end of the month. Hearings, expected to start in January, may not conclude until some time in March (the court does not meet in February).

The appeal may center on the interpretation of "competition." Some say that the original decision was based on too broad a definition of the word, and that Esso has a fair chance to win its appeal.

But the outlook of the case is not all rosy for the supplier. An Esso bid for a temporary injunction, which would have bound Secatore's to fair trade minimums pending decision on the appeal—except in sales to commercial accounts—was denied last week.

Even if Esso's appeal is upheld, it could come too late.

Esso has stopped trying to enforce fair trade minimums in Massachusetts. And other suppliers doubt that they can maintain enforcement if price-cutting spreads.

A breakdown of fair trade could also result from attack from another source—the Justice Dept. Ever since the McKesson & Robbins decision, DJ is said to have felt that suppliers' fair trade agreements have been illegal. If Esso's appeal is rejected, DJ could file antitrust charges.

One DJ lawyer says that gasoline fair trading—regardless of the "competition" factor—is illegal. He contends that gasoline cannot be fair traded "because it is not a commodity bearing a trademark."

The crucial point: Will relaxation of fair trade enforcement lead to a wave of uncontrollable price cutting? So far, it hasn't. But it's still too early to say how bad the cutting may get.

A survey of retail outlets in the East Boston area late last week showed that 33 stations were below the fair trade minimums. This is only two more than the number who were selling under fair trade prices before the Esso-Secatore's court action.

A few observers explain the relatively calm retail price situation this way: Most dealers got their fill of price wars in pre-fair-trade days. So they're not rushing to meet the lower postings of outlets that cut prices as a matter of policy.

But others call the present situation the calm before the storm.

Most marketers look for the worst: price wars springing up wherever fair trade breaks down. They point out that the five states where gasoline is being fair traded are high-gallonage areas.

Competition for volume, they contend, is bound to upset the pricing applecart sooner or later.

New price wars would hurt suppliers and dealers alike. One of the biggest problems would be re-swelling of the ranks of discontented dealers.

Generally, dealers in fair trade areas have been contented during the past few months. They haven't had to complain about depressed margins and smaller profits.

It hasn't been that way throughout the country, however. In areas with deflated prices, dealers have had a lot to say against supplier marketing policies (PW—Oct.19'56,p40).

If a fair trade breakdown results in price wars in five more states, the collective voice of dissatisfied dealers will be a lot louder.

More unhappy dealers would provide new ammunition for legislators who plan to introduce bills to control oil marketing in the upcoming Congressional session.

Suppliers say that, in adopting fair trade, they took the only step available to curb price wars effectively. Still, if a fair trade breakdown results in resumption of the price wars, suppliers will bear the brunt of new legislative attacks.

Rep. James Roosevelt (D., Calif.), is sure to reintroduce his bill for divorcement of the marketing function from integrated oil companies. And S-11, the bill to limit use of voluntary allowances, will also come before Congress early in the session.

Both bills have received considerable support from discontented dealers who have had to ride out price wars. New price wars would probably mean more discontented dealers—and more support for divorcement and S-11.

What's New / IN MARKETING

G. D. McDANIEL's new job means . . .

High Priority for Dealers, Jobbers

The idea of a high-level coordinator for dealer and jobber relations is catching on among major oil companies. Last week, Socony Mobil Oil Co. became the second major to set up such a position within the past four months.

Socony had just picked George D. McDaniel (picture) to fill the new position of assistant for dealer-distributor relations to the director of domestic marketing. He will report directly to Vernon A. Bellman, Socony's new director of domestic marketing, on all matters concerning dealers and jobbers.

Late this summer, Esso Standard Oil Co. made a similar move—it named A. R. Taylor to head its reseller (jobber) division (PW—Sept.7 '56,p39).

Purpose of such jobs: to improve relations between suppliers and the small, independent businessmen with whom they do business.

Both Socony and Esso have made this point clear: they feel that relations with dealers and jobbers have become important enough to demand direct high-level attention as quickly as possible.

Socony's Bellman said as much when he announced McDaniel's appointment: "We believe this new post will make important contributions to Socony Mobil's relations with its thousands of dealers and distributors. Certainly, the fact of its creation testifies to this company's interest in dealer-distributor problems and its concern for the welfare of these independent Mobil businessmen."

Jobbers Renew Plea For Tax Changes

Jobbers are asking for legislation to guarantee tax refunds on gasoline lost by "casualty." They're also urging once more that the system of collecting federal gasoline taxes be changed.

Otis Ellis, general counsel of the National Oil Jobbers Council, recently put these jobber requests to the excise tax subcommittee of the House Ways & Means Committee. Casualty loss, says Ellis, would include all gasoline destroyed by fire, flood, or shipwreck.

NOJC has long requested a change in the tax collection system (PW—Feb.24'56,p45). The jobber proposal: Delay the due date of such taxes until jobbers have had a chance to collect them.

Ellis says that enactment of this proposal "would help change a trend that is causing independent jobbers to yield position in marketing to big oil companies."

•

FTC Hearings Delayed

Federal Trade Commission hearings on price-discrimination and price-fixing charges against Sun Oil Co. and Pure Oil Co. have been delayed.

The Pure case has been temporarily held up by a request from the supplier that FTC clarify its charges. The commission has refused to do this.

Hearings in the Sun case have been rescheduled for Feb. 4.

The hearings are expected to give marketers a clearer idea of FTC's revised position on voluntary allowances (PW—Mar.2'56,p26).

•

The lessening prospect of a gasoline tax boost in New Jersey gives new ammunition to opponents of a similar proposed increase in Delaware.

The competitive status of gasoline retailers on the border of the two states would make a Delaware tax rise unpopular, at best, opponents of Delaware's proposed increase argue.

New Jersey and Delaware legislators have been considering hikes in state gasoline taxes as a means of helping to finance their share of the federal highway program. A 1¢ increase in New Jersey's gasoline tax, proposed by Gov. Robert Meyner, was recently rejected by a caucus of state Republican leaders.

•

Michigan service stations are helping to promote a state-sponsored safe-driving campaign. Retailers in all parts of the state except Detroit are distributing safety stickers to all motorists who sign safe-driving pledges during this month. Some 500,000 sticker are expected to be distributed.

The campaign is being conducted by the Michigan Citizens Traffic Safety Action Committee, which was appointed last summer by Gov. G. Mennen Williams.

•

The Petroleum Retailers Assn. in San Francisco has been at least partly successful in getting dealers to take down signs advertising cutrate prices. The retailers' theory is that if signs come down, prices will stabilize. So far, they've got many of the price-signs down. But prices have remained where they were, a shade below "normal."

Meanwhile, the state attorney general's office has started investigation of gasoline prices (PW—Oct.19'56, p40).

•

Standard Oil Co. (Ind.) is using a de-icer additive in both its premium and regular grades of gasoline this fall. Previously, the additive, which prevents engine stalls from gas line freezing, was used only in the company's premium fuel.

•

The latest anti-trading-stamp campaign by retailers is now under way in Anderson, Ind., where more than 100 dealers have banned stamps.

The dealers announced their intentions to customers recently through a full-page ad in the Anderson Daily Bulletin. Their reasons for dropping stamps are much the same (PW—Apr.13'56,p32) as those given by many other dealers who have taken the same action: "Increased overhead and decreased margins make these 'giveaways' impossible."

The Market Place

AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All Prices as of December 10

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, Cargoes
- Gasoline, 98 oct prem.....13.25-13.5
- Gasoline, 92 oct reg.....11.25-11.75
- Kerosine.....9.75-10
- Heating oil, No. 2.....9.25-9.5
- Gas oil, 48-52 d.i.....9.375-9.5
- **Fuel oil, bunker "C".....$2.40↑-2.80**

Carribean, cargoes
- Avgas, Grade 100/130.....16.75
- Gasoline, 93 oct research prem.....11.5
- Gasoline, 87 oct research reg.....10
- Gasoline, 79 oct research.....9.375
- Gasoline, 70-72 oct motor method.....9.125
- Kerosine.....9.75
- Heating oil, No. 2.....9.25
- Gas oil, 48-52 d.i.....9.375
- Fuel oil, bunker "C".....$2.35

New York Harbor, barges
- Kerosine.....11.25
- Heating oil, No. 2.....10.65
- Fuel oil, No. 6.....$3.05

Okla.-Group 3, northern, shpt, bulk
- Gasoline, 88 oct reg.....11.5-11.75
- Kerosine.....10-10.25
- Heating oil, No. 2.....8.875-9.5
- **Fuel oil, No. 6.....$2.25-2.45↑**

Chicago, bulk
- **Gasoline, 91 oct. reg.....12.25-12.625↑**
- **Heating oil, No. 2.....10.6-10.85↓**
- **Fuel oil, No. 6 high sulfur.....8.3↑-8.6↑**

Los Angeles, rack
- **Gasoline, 84 oct reg.....13.1↑**
- Diesel fuel, PS 200.....9.5-10.75
- Light fuel, PS 300.....3.10
- Heavy fuel, PS 400.....$2.55-2.95

Natural Gasoline, Grade 26-70
- FOB Group 3.....4.5-5
- FOB Breckenridge, Tex.....4

LP-Gas—Propane
- Oklahoma (Group 3).....5

Penna Lubes
- Bright stock, 25 p. t.....27
- 200 vis. neutral, 25 p.t.....25

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent 95 v.i.....24-25
- Neutral, solvent 200-210 vis.....19.75-20.75

Gulf Coast Lubes
- Bright stock solvent, 95 v.i.....25
- Neutral, solvent, 200 vis.....21.5

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, Grade 100/130.....18.375
- **Gasoline, 79 oct research.....10.5↑**
- **Kerosine.....10.875↑**
- **Gas oil, 48 d.i. minimum.....10.625↑**

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9.....$2.82
- North Dakota, 36.0-36.9.....2.82
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9.....3.05
  - Gulf Coast, upper and lower, 26.0-26.9.....2.82
  - West Texas sweet, 36.0-36.9.....2.82[5]
  - West Texas-New Mexico intermediate 36.0-36.9.....2.75
  - West Texas-New Mexico sour, 32.0-32.9.....2.61
  - East Texas flat.....2.90
  - Mirando, 28.0-28.9.....3.11
- Illinois Basin flat.....2.90
- Pennsylvania Grade, Bradford dist, flat.....4.68
- California, Signal Hill, 21.0-21.9.....2.68†
- North Louisiana-Arkansas, 36.0-36.9.....2.82
- Wyoming sweet, 36.0-36.9.....2.75
- Wyoming sour, 32.0-32.9.....2.52

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) D-2, D-3, L.C.....2.54
- Leduc-Woodbend (Alta.) D-2, D-3.....2.60
- Redwater (Alta.) D-3.....2.49
- Daily-Mississippian (Man.).....2.34
- Smiley-Viking (Sask.).....2.26

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido.....3.40
- San Joaquin, 41.0-41.9, Puerto la Cruz.....3.04
- Oficina, 35.0-35.9, Puerto la Cruz.....2.80
- Tia Juana Medium, 26.5-26.9, Amuay.....2.30*
- Bachaquero, 16.5-16.9, Amuay, Las Piedras.....2.05**
- Tarra, 38.0-38.9, San Lorenzo.....2.88
- Lagunillas Heavy, Amuay, Cardon, Las Piedras, flat.....2.20

Differential per ½ deg grav.: (*) 2.5¢ bbl. (**) 3.5¢ bbl.
†Differential per deg. of grav varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabian, 34.0-34.9, Ras Tanura.....1.93
- Basrah, 35.0-35.9, Fao.....1.85
- Iranian, 34.0-34.9, Bandar Mashur.....1.91
- Iranian, 34.0-34.9, Abadan.....1.86
- Iraq, 36.0-36.9, Fao.....1.87
- Kuwait, 31.0-31.9, Mina-al-Ahmadi.....1.72
- Qatar, 41.0-41.9, Umm Said.....2.10

Middle East, Eastern Mediterranean
- **Arabian, 36.0-36.9, Sidon.....2.69↑**
- **Iraq, 36.0-36.9, Tripoli, Banias.....2.69↑**

Far East, Cargoes, FOB Lutong, Sarawak)
- Seria Light, 37-38.....2.60

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U.S. Gulf-New York, clean.....(USMC +205%) $8.69[1]
- U.S. Gulf-New York, dirty.....(USMC +220%) $9.12[1]
- **NWI-USNH, dirty.....(USMC +205%) $8.24†[2]**
- NWI-UK/Cont., dirty.....(Scale +325%) 138/1*
- Persian Gulf-UK/Cont., dirty..(**Scale +325%) 343/6*
- Per. Gulf-USNH, dirty.....(USMC +100%) $25.40

**Sterling **Via Cape of Good Hope Owners asked: (1) $9.98 (USMC +250%); (2) $8.37/8.64 (USMC +210/220%).*

The Market Trend

Never Sell a Gulf Coast Refiner Short

The eye of the buying hurricane passed over the U.S. Gulf this week, and products trading for export went into an ominous lull. There wasn't any easing in demand. It was just that many Suez-caught European marketers were in a changeover process—from individual buying to pool buying—to line up future supplies.

Part of the let-up in buying came about simply because Southwestern refiners were running out of new deals to dream up. Many of them have offered, and sold, gas oil and bunker oil in combination with low-octane gasoline. But now they're fairly well sold out of fuel oils over the winter. So, it's hard to put a trade together—unless foreigners show a lot more interest than they have in high-octane gasolines.

But another stampede of products orders is expected, particularly when committee actions get functioning both here and in Europe. Conservatively, better than 3-million bbl. of products—not counting many times that amount of crude—have been scheduled for export to Europe in the next month or so. The recent selling has been more active even than the flurry right after the Abadan shutdown in 1951. At that time, crude and products deals averaged about 4-million bbl. a month.

And when the next wave of orders comes, there will be dynamic pressure toward higher prices for products. Already, all the low-quoted No. 2, is held for regular-customer takers. Kerosine this week went to a premium on a full-cargo sale. Now, sober-minded refiners are calculating that another 70¢ a bbl. will have to be tacked on to heavy oil prices to make it worthwhile to maximize bunker yields on a breakeven basis from West Texas crudes.

In all the confusion, one pattern stands out: Something always seems to turn up to bail out U.S. refiners when surpluses look imminent. Remember the coal strike and the cold winter of 1947? Then Abadan and the Korean War. Next, the refinery strike of 1952. After that, the Indiana Standard fire. And now, Suez.

Esso Advances:

Esso Standard advanced its heavy oil postings 10¢ a bbl. at Baton Rouge and New Orleans on Dec. 6. The company's new No. 6 tank car prices were $2.48 at Baton Rouge and $2.53 at New Orleans, with barge and ships' bunkering prices 3¢ less.

Iraq Prices Withdrawn:

Shell Petroleum and BP Trading, Ltd., withdrew their posted prices for Iraq (Mediterranean Export) crude at the ports of Tripoli and Banias. These are the ports where the oil flow dried up following sabotage of the Iraq pipeline early last month. Shell's pull-out was retroactive to Nov. 5; BP's to Dec. 1.

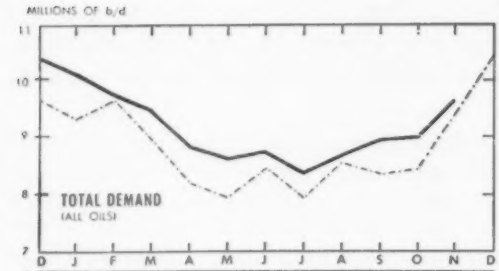
$8.70 a Bbl.:

What freight can do to price shows up in one crude shipment to Europe. The Punta Spiga, an 18,000-ton tanker, will carry a cargo of Persian Gulf crude around Good Hope to Italy at a rate of $51.00 a ton.

The cost of the freight alone on this cargo comes to about $6.73 a bbl. Tack on the f.o.b. cost of the oil—$1.97—and the laid-in price comes to $8.70.

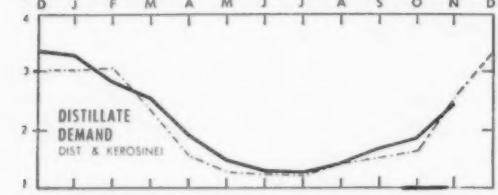
PETROLEUM WEEK'S

Fingertip Figures



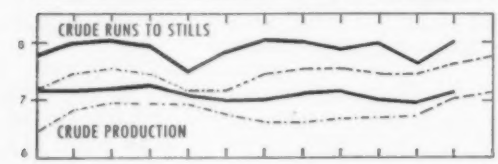
TOTAL DEMAND

Latest 4-week average	10.246
Year ago	9.743



DISTILLATE DEMAND

Latest 4-week average	2.958
Year ago	2.787

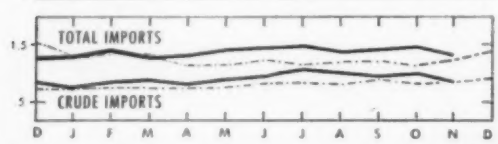


RUNS TO STILLS

Latest week	7.865
Previous week	8.114
Year ago	7.618

CRUDE PRODUCTION

Latest week	7.353
Previous week	7.133
Year ago	6.923



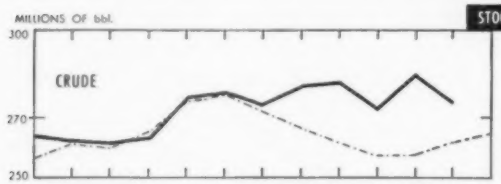
TOTAL IMPORTS

Latest week	1.684
Previous week	1.394
Year ago	1.467

CRUDE IMPORTS

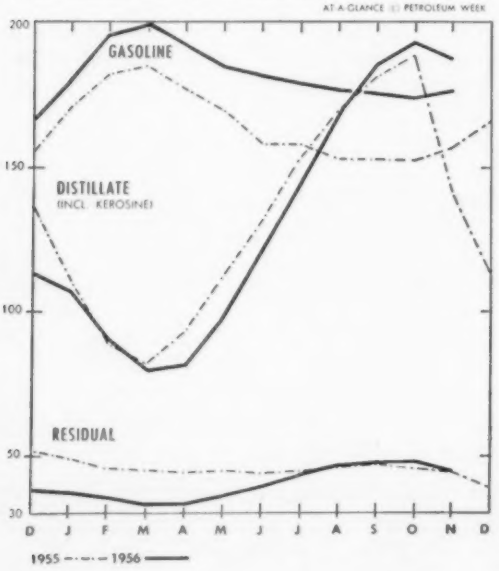
Latest week	1.084
Previous week	.861
Year ago	.957

STOCKS



CRUDE STOCKS

Week ended 12-1	275.3
Previous week	279.8
Year ago	257.7



DISTILLATES

Latest week	178.7
Previous week	188.1
Year ago	166.6

GASOLINE

Latest week	175.4
Previous week	175.4
Year ago	158.4

RESIDUAL

Latest week	43.5
Previous week	44.4
Year ago	42.8

U.S. crude oil production in December will be about 260,000 b/d below estimated demand.

The Bureau of Mines estimate of demand for domestic crude this month is 7,725,000 b/d. It now appears certain that domestic crude production will average only about 7,470,000 b/d —although that's still a new record by a safe margin.

The big reason for the limitation on December output was the action by the Texas Railroad Commission in trimming marginal wells in the state back to their actual production.

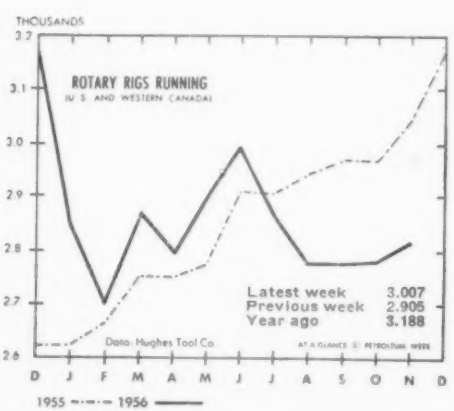
This resulted in a reduction in the starting December allowable in Texas by 16,469 b/d from the mid-November allowable—instead of the increase of 75,593 b/d that was indicated by the boost from 15 to 16 days.

If the expected demand for crude is reached this month, the draft on U.S. crude inventories will amount to nearly 8-million bbl., lowering stocks to about 265-million bbl.—still an adequate working level.

Part of the current withdrawals from crude inventories will be checked in January if Texas should add one or more days to the production schedule.

The Railroad Commission meets Wednesday to set the January allowable. A 17-day schedule (up one day) would add about 145,000 b/d to the allowable in effect in mid-December. It would boost the initial Jan. 1 allowable to about 3,550,000 b/d, a new record.

Such an increase in Texas would boost total U.S. crude oil production in January to around 7.6-million b/d.


THOUSANDS
ROTARY RIGS RUNNING
(U. S. AND WESTERN CANADA)
Latest week 3.007
Previous week 2.905
Year ago 3.188
Data: Hughes Tool Co.
AT A GLANCE ⓘ PETROLEUM WEEK
D J F M A M J J A S O N D
1955 1956

DEPT/Personals

RAYMOND GARY, governor of Oklahoma, was elected chairman of the Interstate Oil Compact Commission at IOCC's annual meeting in Miami Beach, Fla., last week. He succeeds **John F. Simms,** governor of New Mexico. **Clarence T. Smith,** representative to the commission from Illinois, was named first vice-chairman. **J. P. (Dick) Jones,** representing Pennsylvania, was named to the post of second vice-chairman.

THEODORE A. BURTIS has been elected president and chairman of the board of directors of Houdry Process Corp., Philadelphia. He was also elected a director of the corporation's subsidiary, Catalytic Construction Co.

A. A. BUZZI, controller of Shell Oil Co., has been appointed vice-president of API's division of finance and accounting. Buzzi, new chairman of the division's general committee, thus becomes the first API vice-president for the financial and accounting group.

ROBERT L. KIDD (right) and **HARRY D. HANCOCK** (left) have been elected directors of Cities Service Co., New York. Kidd is president of Cities Service Oil Co. (Del.), Bartlesville, Okla.—principal oil and natural gas producing subsidiary of the Cities Service system. He was formerly president of Arkansas Fuel Oil Corp. Hancock is president of Cities Service Gas Co., Oklahoma City.

DWIGHT L. SIMMONS and **WILLIAM B. MOSES, JR.,** have been elected to the board of directors of Seaboard Oil Co. Moses is a trustee of Massachusetts Investors Trust, of Boston. Simmons, managing partner of Thompson, Knight, Wright & Simmons, Dallas law firm, has represented Seaboard for more than 20 years.

H. M. VAN CLIEF, superintendent of Honolulu Oil Corp.'s California division, at Taft, Calif., has been elected chairman of the San Joaquin Valley chapter of the American Petroleum Institute. Other new officers are: **John R. Fraser,** Union Oil Co. of California, first vice-chairman; **Bob Torrey,** Southern California Gas Co., second vice-chairman; and **Don Everitts,** Ohio Oil Co., third vice-chairman.

JAMES C. VANDIVER has been promoted to assistant division landman at El Paso Natural Gas Co.'s newly established land office in Salt Lake City. He was formerly area landman, handling the San Juan Basin from the firm's home office at El Paso, Tex.

WILLIAM K. WHITEFORD, president of Gulf Oil Corp., has been elected a director of General Motors Corp. Whiteford is also a director of Jones & Laughlin Steel Corp. and Procter & Gamble Co.

HAROLD E. VAUGHAN has been named assistant to the vice-president for gas supply, Transcontinental Gas Pipe Line Corp., Houston. He was formerly superintendent of natural gasoline and gas operations for Continental Oil Co.'s CATC marine division.

E. F. KOENIG has been appointed technical representative in the technical services division of The Texas Co.'s research and technical department. He will specialize in the field of additives for petroleum lubricants. His headquarters will be at the Texaco Research Center, Beacon, N. Y.

DOLPHE E. SIMIC (right) has been appointed exploration manager, and **THOMAS P. BROOKS** (left), production manager, of Frankfort Oil Co., Bartlesville, Okla. Simic, a former exploration vice-president of Bay Petroleum Co., recently was associated with a Denver production firm, Halbert, Jennings & Simic. Brooks had been general production superintendent for Southern Production Co., Ft. Worth, before joining Frankfort Oil.

ADOLPH H. CRAWFORD, vice-president and treasurer of Crawford Drilling Co., Shreveport, La., is moving to Lafayette, La. to manage the company's new office. **J. R. (Mike) Crawford,** drilling superintendent, moves to Lafayette from Laurel, Miss., where he held a similar position.

THOMAS H. ALLEN, Wichita producer, driller, and geologist, has been elected president of the Kansas Independent Oil & Gas Assn. **E. B. Shawver,** of Wichita, was reaffirmed as lifetime vice-president. Also elected were: **Hiram Lewis, Jr.,** Wichita, treasurer; **Kenneth Rupp,** Wichita, secretary; and **Tom Orr,** Wichita, executive secretary (re-elected). The following vice-presidents have been named: **Glenn Dunne, Jr.,** Wichita; **Paul Ward,** Hays; **Joe Honaker,** Great Bend; **J. C. Lemon,** Pratt; **Ed Morris,** El Dorado; and **Carl Weiner,** Chanute.

GUY C. BURTON, district geologist for El Paso Natural Gas Co., has been named acting manager of the firm's newly established district office at Amarillo, Tex. Other personnel moved from the El Paso office are **Stewart Beven,** geologist; **Mondel Barnes,** scout; and **Joseph (Bill) Musick,** landman.

HERMAN H. KAVELER, petroleum engineering and management consultant, Tulsa, has been elected a director of Eason Oil Co., Enid, Okla.

CLAUDE L. PEAVEY has been named vice-president and general manager of Britalta Petroleums, Ltd., Calgary, Alta. He was Rocky Mountain manager for Phillips Petroleum Corp. before he joined the Canadian firm in mid-1956. **Frank W. Lake** will manage the Midland (Tex.) headquarters of Wilshire Oil Co., recently acquired by Britalta. Lake has been executive vice-president and general manager of Wilshire.

DR. MOMHAMED MORTADA, senior engineer for Magnolia Petroleum Co., at Dallas, has been chosen as recipient of two major awards for his paper describing better cost control and improved oil recovery and valuation. He will receive the Alfred Noble Prize, major award of five top engineering groups, and the Rossiter W. Raymond Award, conferred by the American Institute of Mining, Metallurgical & Petroleum Engineers.

CHARLES F. HAYES has been named vice-chairman of the accounting committee, and **N. H. WHELESS, JR.,** vice-chairman of the transportation committee, of the American Assn. of Oilwell Drilling Contractors, Dallas. Hayes is secretary-treasurer of Rimrock-Tidelands, Inc., New Orleans, and Wheless is vice-president of Wheless Drilling Co., Shreveport.

R. B. KELLY and **VIRGINIA LAWS** will operate Dallas offices for Calvert Drilling Co. They have operated the firm's Denver office, which is being

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closed. Calvert expects to increase its activity in the San Juan Basin and the Southwest.

TENISON DRILLING CO., Billings, Mont., has expanded its board of directors from three to seven members. The four new directors are: **Ralph L. Ward, Winston Cox, H. W. Wolff,** and **R. K. Peete.**

JAY KIRKMAN is the new president of Graywash Oil Co., Amarillo, Tex. Kirkman, **John D. Durant**, of Florida, and **L. D. Best**, of Oklahoma, have purchased the firm's corporation structure and stock. Durant is vice-president. The firm expects to enter leasing and exploration activity in the Panhandle area.

CLARENCE W. COFFEY has been appointed comptroller of The California Co., New Orleans. He was formerly manager of accounting. **S. D. Moore** and **Jack K. Ellison** have been appointed assistant comptrollers. Moore was formerly manager of the treasury division, and Ellison was chief accountant.

H. E. PRUNTY, Rocky Mountain regional manager for Standard Oil Co. (Ind.), at Denver, has been chosen chairman of the Oil Industry Information Committee in the Rocky Mountain District. He succeeds **D. R. McCallum**, of Denver, division manager for Sinclair Refining Co. The OIIC district includes Colorado, Wyoming, Montana, Utah, and Idaho.

W. R. SCHUMAN will manage the new branch of McCullough Tool Co., at Medicine Lodge, Kan.

RAWLEIGH WARNER, JR., will manage the economics department of Socony Mobil Oil Co., succeeding **Albert J. McIntosh**, who will serve as consultant to the public relations department. Warner also has been appointed to the company's coordination committee. He joined Socony in 1953 as assistant to the vice-president and director of finance of Socony-Vacuum Overseas Supply Co. He later served as treasurer of Socony-Vacuum Overseas and as assistant treasurer for Mobil Overseas Oil Co. He came to the parent company's finance department last April.

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Walnut 5778

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Hubbard 2-7160

Chicago 11 — D. O. Hanson
W. F. Holbrook
520 North Michigan Avenue
Mohawk 4-5800

Cleveland 15 — J. E. MacArthur
1510 Hanna Bldg.
Superior 1-7000

Houston 25 — David G. Sawyer
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter S. Carberry
1125 W. Sixth St.
Madison 6-9351

New York 36 — Edward A. Callahan, Jr.
Donald R. Thompson
330 West 42nd Street
Longacre 4-3000

Philadelphia 3 — W. A. Potter
Architects Building
Rittenhouse 6-0670

San Francisco 4 — William C. Woolston
68 Post Street
Douglas 2-4600

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209 Constantine Bldg.
611 South Boston
Gibson 7-5594

England, London E.C.4 — Herbert Lagler
McGraw-Hill Co., Ltd.
95 Farrington St.

Other Oil Industry Personnel Changes:

Company	To:	From:
American Mineral Spirits Co.		
John J. Buckley	V-p, fuel oil dept, Murray Hill, N. J.	Asst v-p, fuel oil dept, Murray Hill
American Oil Co.		
William A. Sullender	Asst mgr of oper, mktg, New York City	Asst genl supt of oper and util, Texas City (Tex.) refinery
Reader G. Anderson	Asst genl supt of oper and util, Texas City refinery	Asst to genl mgr of mfg, New York
Cities Service Oil Co. (Del.)		
Robert R. Chastain	Asst reg mgr, Cleveland (Ohio) mktg reg	Mgr, Ohio div
Carl A. Wesberg	Supt, supply and dist, Cleveland mktg reg	Reg oper supt, Cleveland
Charles P. Rader	Reg oper supt, Cleveland	Supvr, serv station expansion, Chicago
Forest Oil Co.		
Gene Shaw	Geologist, Denver	Geologist, American Stratigraphic Co., Denver
Ray Blakely	Geologist, Denver	Geologist, Stanolind Oil & Gas Co., Albuquerque, N. M.
Jones & Laughlin Supply Div.		
Donald R. Gray	Store mgr, Clay City, Ill.	Storeman, St. Elmo, Ill.
Kerr-McGee Oil Industries, Inc.		
Odell Campbell	Tech asst to refining v-p, Oklahoma City	Lab mgr, E. I. du Pont de Nemours & Co., Tulsa
Lewis Bros., Inc.		
Robert W. Bax	Pet eng, Denver	Dist eng, The Texas Co., Williston, N. D.
Louis L. Bailey	Chief accountant, Denver	Accountant, Lewis Drilling Co., Wichita, Kan.
National Tank Co.		
M. F. Brown	Branch mgr, New Town, N. D.	Williston (N. D.) office
Ohio Oil Co.		
Dr. Alan S. Horowitz, Dr. Peter R. Taussig	Research staff, Denver, Colo.	
Patterson Oil Co.		
Dennis E. Youngblood	Asst to v-p, Philadelphia	Oper mgr, Great Lakes Solvents, Inc., Chicago
Pressed Steel Tank Co.		
Robert P. Ricker	Sales mgr, New York	Sales mgr, Downingtown, Pa.
James A. Varnado	Sales mgr, Downingtown	Dist mgr, Kansas City
Reed Roller Bit Co.		
H. B. Wilson	Eastern div sales mgr, Carmi, Ill.	Div sales mgr, Calgary, Alta.
M. F. Wright	Div sales mgr, Calgary	Special salesman, Oklahoma City
Security Engineering Div., Dresser Industries		
Theodore L. Walker	Works mgr, Dallas	Gen plant mgr, Clark Equipment Co., Jackson, Mich.
Shell Chemical Corp.		
H. E. Hughes	Plant mgr, Denver	Plant supt, Houston
J. W. Hyde	Plant supt, Houston	Asst supt, oper, Houston
Shell Oil Co. of Canada, Ltd.		
J. L. Miller	Mgr, Montreal refinery	Oper supt, Shell Oil Co. refinery, Houston
Socony Mobil Oil Co.		
George D. McDaniel	Asst, for dealer-distrib rel, to dir of domestic mktg, New York City	Genl mgr, Eastern reg
Southwest Research Institute		
Robinson Brown	Mgr, mech devel, dept of eng mech, San Antonio	Sr mech eng, San Antonio
Standard Oil Co. of California		
Richard M. Price	Asst reg mgr, Sacramento	Dist sales mgr, San Jose, Calif.
Albert B. Woodside	Dist sales mgr, San Jose	Dist sales mgr, Marysville, Calif.
Standard-Southern Corp.		
Ben Poelking	Mgr, sales office, Baton Rouge, La.	Purch dept, Bechtel Corp.
The Texas Co.		
Ellis E. Ball	Asst dist supt, Salem, Ill.	Field foreman, Hays, Kan.
Helge Oscar Hamann	Sales rep, Los Angeles	Sales rep, Husky Oil Co., Cody, Wyo.
Transcontinental Gas Pipe Line Co.		
Jack F. Gale	Super, gas purch, Houston	Gas contract rep, Houston
N. W. Lassiter, Jr.	Div supt, compressor stns dept, Houston	Sr eng, compressor stns dept, Houston
Win-Well Mfg. Co.		
C. J. Baeten	Sales rep, Wichita, Kan.	
G. H. Osborn	Sales rep, Edmonton, Alta.	
New Ventures—		
D. D. Heninger	Consulting geologist, Wichita Falls, Tex.	Dist geologist, North Texas dist, Ohio Oil Co.
William O. Antonides	Oil prop broker, Glenwood Springs, Colo.	
Walter M. Wilkinson	Wilkinson Drilling, Inc., Wichita, Kan.	

Needed: Wartime Unity

THE TASK OF GETTING sufficient oil to Europe is going to be a tough one. You don't drop a problem of that size on an industry—even on a big, competent industry—without creating stress and strain.

In some respects, it will be more difficult under current conditions than during actual wartime. In war there is a unity of purpose, and there's more willingness to give and take as the situation requires. In peacetime, however, opinions and aims differ. A man is apt to do more standing on his rights. And critics are quicker to give voice to real or imaginary wrongs.

SOME DISSENT is already cropping up, even as the government readies its oil-to-Europe plan. Sen. Joseph C. O'Mahoney (D., Wyo.) has started throwing darts at the Middle East Emergency Committee. He thinks Congress should be called into session to work out a plan. (If Congress were to move at its usual speed, Europeans would be in for a long, hard winter.)

Others are going to be unhappy, too. For instance, if the Texas Railroad Commission departs from its practice of across-the-board proration in order to step up allowables for fields in the Gulf Coast region (because that crude could more readily be moved to tidewater ports), there is sure to be protest from inland producers who wouldn't get as high allowables.

Some domestic refiners, watching domestic gasoline stocks climb, are going to urge that products—in addition to crude—be sent to Europe. Other refiners, feeling the pinch of increasing crude oil prices, will press for product price hikes here. This, in turn, will bring squawks from marketers and, most likely, from the general public.

The scramble for tankers has already pushed tanker rates up, giving birth to rumors that the government is considering setting a price ceiling on those rates. Such action is unlikely, but you may have noted that government officials have not said flatly that there will be no price controls.

And if the government allocates steel for tankers, there will be a hue and cry from other oil segments and other steel-using industries caught in the pincers of a dwindling steel supply and higher steel prices. Pandora's Box would really be open if the government should take the next step and allocate all steel. We'd soon have controls all over the place.

THERE ARE NO easy solutions. Obviously this nation cannot stand by and let Europeans suffer this winter for lack of oil while their economies tailspin into chaos.

Rather, there must be a large application of cooperation, understanding, and forebearance. There doesn't need to be an outright war to make this possible.

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